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of Engineers**

New York District  
New York, New York

**ATLANTIC CITY NAVAL AIR STATION  
FORMERLY USED DEFENSE SITE (FUDS)  
EGG HARBOR TOWNSHIP, NEW JERSEY**

**Contract No. W912DR-09-D-0015  
FUDS Project # C02NJ0977-02  
Task Order No. 0017**

**FINAL  
AREA W SITE INVESTIGATION REPORT**

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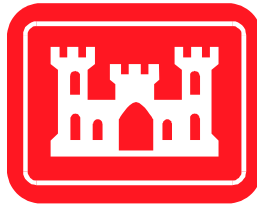
**AUGUST 2012**

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**PREPARED FOR:  
U.S. ARMY CORPS OF ENGINEERS  
NEW YORK DISTRICT  
26 FEDERAL PLAZA  
NEW YORK, NEW YORK 10278**

**PREPARED BY:  
  
WESTON SOLUTIONS, INC.  
205 CAMPUS DRIVE  
EDISON, NJ 08837**

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## LIST OF ACRONYMS

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ACMUA	Atlantic City Municipal Utilities Authority
AMB	Airways Modernization Board
AOC	area of concern
ASTM	American Society for Testing and Materials
Atlantic City NAS	Atlantic City Naval Air Station
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chain-of-custody
DERP-FUDS	Defense Environmental Restoration Program/Formerly Used Defense Sites
DO	dissolved oxygen
DOD	U.S. Department of Defense
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
ft	feet/foot
GPS	global positioning system
IGWSRS	Impact to Groundwater Soil Screening Criteria
MCL	Maximum Contaminant Levels
MDL	method detection limit
MMRP	Military Munitions Response Program
NBAC	North Branch of Absecon Creek
NFA	no further action
NJDEP	New Jersey Department of Environmental Protection
NRDSRS	Non-residential Direct Contact Soil Remediation Standards
NRWQC	National Recommended Water Quality Criteria
NTU	Nephelometric Turbidity Units
ORP	oxidation-reduction potential
PCB	polychlorinated biphenyls
PID	Photoionization Detector
PQL	practical quantitation limits
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RDCSRS	Residential Direct Contact Soil Remediation Standards

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## **LIST OF ACRONYMS CONTINUED**

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RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RSL	Regional Screening Levels
SBAC	South Branch of Absecon Creek
SI	Site Investigation
Site	Atlantic City Naval Air Station, Egg Harbor Township, New Jersey Area W
SVOC	semivolatile organic compounds
SWQC	Surface Water Quality Criteria for Toxic Substances
The Pinelands	Pinelands National Reserve
TRC	TRC Environmental Corporation
U.S.	United States
USACE	United States Army Corps of Engineers
VOC	volatile organic compounds
WESTON®	Weston Solutions, Inc.
WP	Work Plan

## **EXECUTIVE SUMMARY**

This report presents the Site Investigation (SI) for Area W of the Atlantic City Naval Air Station (Atlantic City NAS) located in Egg Harbor Township, New Jersey (Figure 1-1). The objective of the SI is to determine if U.S. Department of Defense (DOD) related contamination is present within Area W and whether or not a subsequent Remedial Investigation/Feasibility Study (RI/FS) of Area W is necessary. A secondary focus of the investigation was to investigate whether there is any potential relationship between Area W and mercury contamination within soil, sediment, and surface water potentially impacting Area U (an area immediately adjacent to the North of Area W which is currently being investigated under a separate investigation). The SI was conducted in accordance with the United States Army Corps of Engineers (USACE) Engineer Regulation No. 200-3-1 Formerly Used Defense Sites (FUDS) Program Policy, May 2004. The report follows current U.S. Environmental Protection Agency (USEPA) and New Jersey Department of Environmental Protection (NJDEP) policy and guidance.

The investigation, in accordance with the approved Work Plan (Weston 2010), evaluated soil and groundwater samples collected from six locations within Area W in comparison to applicable criteria as well as samples from two site-specific background locations. Additionally, surface water and sediment samples were collected from the South Branch of Absecon Creek, topographically downgradient of Area W, in order to investigate whether any off-site migration of potential contaminants was evident. All samples were compared to applicable USEPA and NJDEP criteria as well as appropriate ecological and human health screening criteria.

Overall, the data collected in this investigation were sufficient to evaluate the nature and extent of potential contamination in soils and groundwater at Area W in order to determine whether additional investigation or action is necessary. Based on review of the collected information and data, no disposal of hazardous materials is indicated at Area W either by record or observation. Therefore, the results of this site investigation do not indicate the need for further investigation or response action at Area W under the FUDS program.

In addition, the secondary objective of the investigation was to determine whether there is any evidence of a relationship between Area W (i.e., as a potential source area) and previously identified mercury impacts downgradient from the site within the SBAC and Area U. Only groundwater sample exhibited a concentration of mercury (0.174 ug/l) that exceeded the NJDEP PQL (0.05 ug/l), however mercury concentrations of up to 0.58 ug/l have been measured upgradient and off site of Area W. Based on a review of the collected information and data, there is no indication that Area W serves as a potential source area of mercury impacts to the downgradient SBAC and Area U where higher concentrations of mercury have been measured.

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## **SECTION 1**

### **INTRODUCTION**

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# **1 INTRODUCTION**

Weston Solutions, Inc. (Weston<sup>®</sup>) has prepared this Site Investigation report (SI) for Area W of the Atlantic City Naval Air Station (Atlantic City NAS) located in Egg Harbor Township, New Jersey (Figure 1-1). Work was performed by Weston for the United States Army Corps of Engineers (USACE) under Contract No. W912DR-09-D-0015. This SI report addresses the sampling and analysis tasks associated with Area W (Site). The investigation was conducted to determine if U.S. Department of Defense (DOD) related contamination is present within Area W (Figure 1-2) and whether or not a subsequent Remedial Investigation/Feasibility Study (RI/FS) of Area W is necessary. A secondary focus of the investigation was to investigate whether there is any potential relationship between Area W and mercury contamination within soil, sediment, and surface water potentially impacting Area U (an area immediately adjacent to the North of Area W which is currently being investigated under a separate investigation) (Figure 1-1).

## **1.1 BACKGROUND AND SITE DESCRIPTION**

In 1942, the Atlantic City NAS was constructed on 2,444 acres of leased private land to train various air groups for combat. In August 1943, Atlantic City NAS changed to only fighter training. The Atlantic City NAS was transferred from the U.S. Navy to the Airways Modernization Board (AMB) in June 1958. In November 1958, the Federal Aviation Administration (FAA) took over operations of the AMB. The FAA expanded the former Naval land parcel to approximately 5,000 acres. The site is located in the Pinelands National Reserve (The Pinelands), approximately 9 miles northwest of Atlantic City, as shown on Figure 1-1. The current FAA parcel, known as the William J. Hughes Technical Center, accommodates air traffic, airway facilities, systems research and development, flight inspection personnel of the FAA, an office of the National Weather Service, the 177th Fighter-Interceptor Group of the New Jersey Air National Guard, and serves as the Atlantic City International Airport. The Technical Center is located in the lowland area of The Pinelands and support a diversity of wetland communities.

Currently, Area W is a primarily wooded site with surface soils described as fine to gravelly sands. There are no surface water features within Area W. The channelized portion of the South Branch of Absecon Creek (SBAC) is located approximately 400 feet northeast of the site and a

small former meander of the SBAC is located approximately 300 feet to the northeast of the site.. Roughly the eastern third of the site is 2 to 6 feet lower than the southern and western half of the site and appears sands were excavated as part of a borrow pit (Figure 2-1).

Area W was identified as a potential area of concern (AOC) in 2005 based on site visits conducted by FAA, and is suspected of being an undocumented dumpsite that was created during the 1950s based on items discovered on the site. Items previously found at Area W include fragments of Navy dinnerware and a piece of a broken glass tube that has dimensions consistent with a CAIS ampoule (FAA, 2005). It was later determined that the broken glass tube was not associated with munitions or chemical warfare materials. As Area W was identified in 2005, it was not included in an Archive Search Report (ASR) or Supplemental ASR prepared by the USACE in 1996 and 2004 (respectively). Area W was subsequently added to the Atlantic City NAS FUDS in February 2006 as documented in an Inventory Project Report prepared by USACE (2006).

Historical aerial photographs of the area from 1932 indicate clearing and potential sand removal prior to Navy occupation of the site (Appendix A). Review of the historical aerial photos from 1940 to 1957 shows revegetation with little if any evidence of new activities. Then in 1959 (following the transfer of the airport to FAA) the historical aerial photographs indicate activities on the northern side of Area W that appear to be related to the construction of Building 170 to the southeast. The Area W boundary was determined by FAA and follows the edge of the native forested landscape and the lower elevation disturbed area where sand removal occurred in the past.

In 2006, Parsons was contracted by USACE to perform a Military Munitions Response Program (MMRP) site inspection for chemical warfare material and a qualitative reconnaissance at the former Atlantic City NAS. The objective of the MMRP site inspection was to determine if individual Munitions Response Sites (including Area W) warranted further investigation for munitions and explosives of concern, including chemical warfare materiel, and for munitions constituents. To accomplish this objective, historical documents such as the Archives Search Report, Archives Search Report Supplement, and the Inventory Project Report were reviewed. The Parsons MMRP Site Inspection report is provided in Appendix B (Parsons, 2007).

Parsons (2007) reported that no evidence of chemical warfare material, munitions or explosives, or small arms debris was observed. Additionally, five shallow excavations (4 feet below ground surface [bgs]) were completed and did not identify any evidence of buried chemical warfare material, munitions or explosives, or small arms debris. Eleven soil samples (0 – 4 feet bgs) and 17 groundwater samples (collected from 4 foot screened intervals ranging from 11 – 115 feet bgs) were collected at Area W and analyzed for chemical agents and chemical agent breakdown products. One sediment sample was collected to the northeast of Area W in the SBAC (downstream from the site) and analyzed for metals and explosives. Results yielded no indication of chemical warfare material at Area W.

Downgradient of Area W within the SBAC watershed, numerous Site and Remedial Investigation studies performed by FAA indicate that mercury is the main contaminant of concern at Area U, which encompasses the north and south branches of the Absecon Creek (NBAC and SBAC), and the Upper and Lower Reservoirs of the Atlantic City Municipal Utilities Authority (ACMUA), which are contributing water supplies to Atlantic City, New Jersey proper. Mercury has been detected in sediments of the SBAC, NBAC, Upper and Lower Reservoirs, and in surface water, floodplain soils, groundwater, and biota within the watershed. A previous FAA report concluded that the mercury impacts are related to the U.S. Navy's former use of the Site. To date, no mercury contamination has been associated with Area W, and no mission-related source of mercury has been found at Area U.

## **1.2 PROJECT OBJECTIVES**

The overall purpose of this project is to conduct a SI to identify and delineate potential DOD-related contamination sources at Area W. The SI activities focused on two primary objectives:

- To obtain sufficient information and data regarding the quality of site soils and groundwater so that the nature and extent of potential contamination at Area W can be established.
- To evaluate Area W soil and groundwater data quality to support potential recommendations such as no further action (NFA), a removal action, additional investigation to fill data gaps, or a Remedial Investigation (RI) under the provisions of CERCLA.

To meet these objectives, the following activities were performed:

- An underground utilities survey;

- Ambient air monitoring;
- Sampling and analysis of soil and groundwater from within Area W;
- Background sampling and analysis of soil and groundwater;
- Sampling of surface water and sediment within the SBAC downstream of Area W in order to determine if contaminants, if any, found in Area W are migrating off site;
- Background sampling of surface water and sediment within the SBAC upstream of Area W.

A secondary objective of the investigation was to investigate whether there is any potential relationship between Area W and mercury contamination found within soil, sediment, and surface water in the adjacent Area U.

The detailed procedures that were followed during the investigation are described in section 2.0 of this SI report.



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## **SECTION 2**

### **AREA W INVESTIGATION PROCEDURES**

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## **2 AREA W INVESTIGATION PROCEDURES**

### **2.1 MOBILIZATION/SITE PREPARATION**

Prior to commencing intrusive activities at Area W, a site reconnaissance was performed on 28 February 2011 and included an underground utilities survey, ambient air and radiological monitoring, and sample location selection.

#### **2.1.1 Site Reconnaissance**

The Area W boundary was determined by FAA and follows the edge of the native forested landscape and the lower elevation disturbed area where sand removal occurred in the past. As part of the site reconnaissance, the boundaries of Area W (as provided electronically from FAA) were located (within 50 centimeter accuracy) using a Trimble Global Positioning System (GPS) Pathfinder Pro XRS (collected via TerraSync) [NAD83 NJ State Plane (horizontal) and NAV88 (vertical)] with real-time differential correction. (This system was utilized throughout all investigations to complete surveys of sample locations and other pertinent investigation features unless specified otherwise). The boundary was flagged approximately every 30 feet in order to provide a visual reference for the boundaries of the site (Figure 1-2). Next an approximately 20 foot wide transect grid survey was conducted. The grid survey included both visual and magnetometer (Schonstedt) scans. Areas of interest or anomalies were noted and flagged and sample locations were selected on the basis of the findings and gradients. The Trimble GPS was used to document the sample locations.

#### **2.1.2 Site Description of Background Locations**

The area established for the background locations (Figure 2-2) is upgradient of Area W along the headwaters of the SBAC watershed in the southwest corner of the FAA property. The background area is primarily wooded with surface soils described as fine to gravelly sands (Appendix E). The area is generally flat however; any run-off would flow towards the SBAC and associated wetlands. The two paired soil and groundwater background sample locations were positioned along the southern boundary of the FAA property. One location was downgradient (east) of Winzinger Landfill while the other location was upgradient (west) of Winzinger Landfill. The two paired surface water and sediment sample locations were positioned at the

upstream extent of the SBAC (SW/SD-001) while the second set was positioned just downgradient of potential overland flow from Winzinger Landfill. The headwaters of the SBAC run towards the east and is discontinuous and groundwater fed at the time of sampling. Significant wetlands are located on either side of the SBAC in this area.

### **2.1.3 Underground Utilities Survey**

Prior to commencing intrusive activities at the Site, the drilling subcontractor, Tabasco Drilling, Inc. contacted One-Call. The utility owners were notified to provide the location of their underground utilities that are positioned on or adjacent to the Site and the active work area. A private underground utilities locator (Enviroscan) was subcontracted to screen within the Area W boundary as well as the background sample locations. Utility tracing was conducted using a Radiodetection RD8000 digital cable and pipe tracer. The RD8000 has the capability to locate metallic pipes, cable, or wire. The site and background locations were also scanned with a Radiodetection C.A.T. and Genny pipe and cable locator and tracer which can determine live lines and positioning. A Fisher TW-6 was used to detect any unknown utilities (Appendix C). In addition, FAA was contacted in advance of intrusive activities so that the facilities Center Operations and Maintenance Services and/or their contractor (All Star Services) could provide site mark outs.

### **2.1.4 Air and Radiological Monitoring**

Ambient air monitoring (volatile organic compounds [VOCs], mercury vapor, and radiation) was conducted during the non-invasive site reconnaissance in order to provide a baseline. During active phases of the work, ambient air and radiological monitoring was also conducted to ensure worker safety. Ambient air was monitored within and around the active work zone for VOC, mercury vapor, and radiation. A miniRae photo-ionization detector with a 10.6 ev lamp was used to monitor for VOCs during soil sampling activities. A Jerome 431X was used to identify mercury vapor concentrations in the work areas prior to and during all sampling activities.

Monitoring for radiation was initiated at the onset of each intrusive task to verify that no hazards exist by utilizing a Micro/R with an action level of any sustained readings above three to five times background concentrations (Weston, 2010). Background radiation exposure rates ranging

from four to five microrem per hour are based on the results of the Radiological Scoping Survey of the FAA William J. Hughes Technical Center (TRC, 2007).

## **2.2 SAMPLING PROCEDURES**

Site soil and groundwater sampling activities occurred within the Area W boundary. As no surface water features are found within Area W, surface water and sediment sampling was conducted along the SBAC located approximately 400 ft to the northeast of Area W (Figure 2-1) in order to determine if contaminants, if any, found in Area W are migrating off site. Soil, sediment, surface water, and groundwater samples were also collected at two background soil/groundwater locations and two surface water/sediment locations within the SBAC upstream from Area W. One soil/groundwater background location is approximately 0.1 miles to the north northwest and the other is approximately 0.75 miles to the northwest (Figure 2-2). The two surface water/sediment background locations were collected within the available surface water features both east and west of the potential impact of the Winzinger Landfill approximately 0.5 miles to the northwest of Area W. (Figure 2-2).

With the exception of deviations noted below (Section 2.3.1), all samples were collected in accordance with *Combined Work Plan And Sampling And Analysis Plan Site Investigation At Area W* (Weston, 2011), *NJDEP Field Sampling Procedures Manual* (NJDEP, 2005), *Engineering and Design, Chemical Data Quality Management for Hazardous Waste Remedial Activities*, ER-110-1-263 (USACE, 1998), *USACE Requirements for the Preparation of Sampling and Analysis Plans*, EM-200-1-3 (USACE, 2001) and *EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988) Specific sample containers and preservations were used according to Appendix I of the *USACE Requirements for the Preparation of Sampling and Analysis Plans*, EM-200-1-3 (USACE, 2001) and analytical method requirements. All applicable field sampling equipment was decontaminated prior to use as per the *Combined Work Plan And Sampling And Analysis Plan Site Investigation At Area W* (Weston, 2011). Table 2-1 lists the analytical methods by media, utilized by the subcontracted laboratories.

To minimize cross-contamination during the sampling process for mercury only, clean techniques were followed using the guidance of EPA Method 1669 (EPA, 1996). Samples were

collected in a sequence that precludes contamination of surface water samples with sediment. Specifically, the sequence of sampling events involved the measurement of water quality indicator parameters then the collection of a surface water sample, and finally the collection of the sediment sample. In addition, clean techniques were employed as briefly described here. Prior to sample collection, all equipment was cleaned according to standard techniques and anything not known to be clean was considered “dirty”. Field collection was conducted using clean/dirty hands techniques with one person being designated the “clean” hands sampler and another being the “dirty” hands sampler, according to EPA Method 1669. In addition, no-talc clean gloves were used and field equipment blanks were collected. Additionally, the sampling site was approached from downstream or downwind, and the sample was taken facing upstream or upwind.

### **2.2.1 Soil Samples**

Soil sampling was conducted at six locations within Area W, as determined during the site reconnaissance (Figure 2-1). Two additional background soil sample locations were collected west of the site (upgradient within the SBAC watershed) (Figure 2-2). A total of sixteen soil samples (two per location) plus one QA/QC samples were collected and analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, cyanide, low level mercury, total solids, and total organic carbon (TOC). A summary of the soil samples is provided in Table 2-2.

Samples were collected from 0.0 to 0.5 feet bgs for VOC analysis by Encore samplers directly from the undisturbed surface soil prior to collection with 4-inch bucket augers for the remaining analytical parameters. Subsurface samples were collected at the 0.5 foot interval immediately above the water table, utilizing a direct-push method (Geoprobe®) by the drilling subcontractor, Tabasco Drilling Corporation. At each of the 8 locations, soil samples were collected utilizing a 5-foot dedicated, disposable acetate sleeve enclosed within a stainless steel sampler which was decontaminated between samples. Each 5-foot soil core was retrieved from the subsurface and the acetate sleeve was cut open and visually inspected. The soil within the macrocore was immediately screened in 6-inch intervals with a photoionization detector (PID).

Soil samples were first collected via Encore sampler for VOC analysis, then lithology was recorded on soil boring logs (Appendix D). The remaining soil was homogenized in a disposable aluminum pan using a disposable plastic trowel. The soil was placed into a clean, appropriately sized sample container and packaged, documented on the chain-of-custody (COC), and picked up by courier or shipped to the appropriate laboratory. A photograph log of soil sampling is provided in Appendix E.

### **2.2.2 Groundwater Samples via Temporary Well Points**

The groundwater temporary well points were installed at each of the six soil sample locations within Area W (Figure 2-1). Two additional soil/groundwater couplets were installed west of the site (upgradient within the SBAC watershed) (Figure 2-2) and served as the background locations. A total of ten groundwater samples plus one QA/QC sample were collected and analyzed for VOCs, SVOCs, pesticides, PCBs, metals, cyanide, low level mercury, methyl mercury, and hardness. A summary of the groundwater samples is provided in Table 2-3. Temporary well points were installed following the determination of depth-to-groundwater during the soil sampling.

Groundwater was collected from the top five feet of the water table. Each well point was installed by advancing steel casing with expendable drive point and installing a length of 1-inch outer diameter PVC (prefabricated with 5 ft of 0.010-inch slot size screen at the bottom). The casing was advanced with the expendable drive point to the appropriate depth, the pre-screened PVC well point was installed into the borehole, and the casing was extracted to allow natural sand to pack around the temporary well screen. Field purging utilized a peristaltic pump and dedicated Teflon-lined polyethylene tubing. The temporary well point screen was set to collect groundwater from the top five feet of the water table. The temporary well points were developed by calculating the volume of the 1-inch diameter well; using the total depth and depth to water then purging three volumes from the temporary well points with sufficient groundwater recharge (GW-001, GW-003, GW-007, and GW-008). This was done to remove silt and establish groundwater flow into the well following installation. The temporary well points with poor recharge (GW-002, GW-004, GW-005 and GW-006) were developed by purging the temporary well point dry, allowed time to recharge and purged dry again.

Due to poor recharge rates at temporary well points GW-002, GW-004, GW-006, NJDEP was contacted and an extension to the 48 hour maximum allowable open well point requirement was requested. After receiving approval from the NJDEP case manager (Atiya Wahab, March 3, 2011, via email), well points remained in place until the sampling of all eight temporary well points was completed. The temporary well points were in place for a total of nine days from installation to removal. In order to collect sufficient aliquots of sample to support all required analyses the purging occurred over two sampling days (7 March 2011 and 9 March 2011).

Prior to sample collection, a synoptic round of depth to water was recorded from each temporary well point (Table 2-4). The pump intake was set at approximately 6-inches above the bottom of the well. The three-volume purge method was used prior to collection of samples from temporary well points with sufficient recharge (GW-001, GW-003, GW-007, and GW-008). The peristaltic pump and Teflon-lined polyethylene tubing were used to extract the filtered and unfiltered sample aliquots for water quality parameters where possible (Table 2-5), metals, PCBs, pesticides, SVOCs, mercury and methyl mercury analysis from temporary well points with sufficient recharge (GW-001, GW-007, and GW-008). Only an unfiltered sample aliquot was collected from temporary well point GW-003 due to poor recharge. Following collection of all other parameters, the peristaltic pump was turned off and the tubing was removed from the temporary well point. A Teflon-lined bailer was used to collect the sample aliquots for VOC analysis.

Since poor groundwater recharge was encountered at four temporary well points (GW-002, GW-004, GW-005, and GW-006), these wells were purged dry using a peristaltic pump and Teflon-lined polyethylene tubing. The temporary well points were allowed time to recharge. This method was repeated until the turbidity of the groundwater was below 20 Nephelometric Turbidity Units (NTU) prior to sample collection. Despite the methods employed to collect samples without turbidity, described above, following analysis, it was identified that the unfiltered samples from locations GW-004 and GW-005 likely had elevated turbidity levels. Section 3.2.2 provides additional discussion on this issue. The recharge at locations GW-002, GW-004, GW-005, and GW-006 (approximately 40 ml per 30 minutes) limited the list of analytes because of the required volume for analysis by the subcontracted laboratories. For this reason, filtered samples were not collected at GW-002, GW-004, GW-005 and GW-006. The

laboratory-required minimum volume was collected by means of extraction via peristaltic pump, for metals, PCBs, pesticides, SVOCs, mercury and methyl mercury analyses. The sample aliquot for VOC analysis was collected via Teflon-lined bailer.

Each groundwater sample was packaged, documented on the COC, and picked up by courier or shipped to the appropriate laboratory.

In order to create local groundwater elevation and flow direction estimates, vertical elevations for the temporary well point locations were established through the conversion of existing site topography to a raster file and extruding the raster elevation values. A spatial join was employed to establish ground elevation for the well locations. Once vertical elevations were established the individual well data was normalized to account for height above the ground surface for ground water measurement points. Groundwater elevations are based on depth below ground surface elevations. Topography was developed through the use of the USGS Digital Elevation Model (DEM) 10 meter grid and then extrapolated for tighter contour intervals through ESRI's Spatial Analyst.

### **2.2.3 Surface Water Samples**

Surface water samples were collected from four surface water locations (Figure 2-1) outside of Area W. Three of the surface water locations were located within the SBAC downstream of Area W and one location was upstream, just below English Creek Road. In addition, two background surface water locations were located within the SBAC upstream of English Creek Road (Figure 2-2). SW-001 was the most downstream surface water sample location and was collected from the channelized main channel of the SBAC in approximately 1 foot of water. The channelized main channel of the SBAC is approximately 10 feet wide with a primarily sandy substrate with slow but flowing water. SW-004 was also collected from the channelized main channel of the SBAC, in a depositional area just downstream of the English Creek Avenue road crossing (the SBAC runs through a culvert). SW-002 was located in a drainage ditch emanating from the Building 170 area. The drainage ditch is approximately 10 feet wide with a primarily silty organic substrate and very slowly flowing water. SW-003 was collected in a former meander of the SBAC which is approximately 5 feet wide and has a very slow flow of clear water underlain by fine organic substrate. Background surface water locations SW-005 was collected in a natural



meander of the SBAC which is discontinuous upstream of English Creek Avenue. SW-005 was collected in a shallow (3 inch) portion of the channel with very little flow and a leaf covered sandy substrate. SW-006 was collected in the most upstream body of water associated with the SBAC that was identified. The sample was collected from a small (15 foot) pool that was isolated from the downstream channel and had a substrate of leaf covered sand and silt. All surface water samples were collected within one foot of the bank or edge of the water. A total of twelve surface water samples (filtered and unfiltered at each location) plus one QA/QC sample were collected and analyzed for VOCs, SVOCs, pesticides, PCBs, metals, cyanide, low level mercury, methyl mercury, and hardness. A sample summary of the surface water samples is provided in Table 2-6. Photographs of surface water sampling are provided in Appendix E.

Prior to surface water sample collection, *in-situ* water quality measurements were collected at each of the sampling locations. *In-situ* measurements were collected using a pre-calibrated YSI 6920 prior to sampling. Data was recorded on DO, temperature, conductivity, ORP, pH, and turbidity (Table 2-7).

At each of six sampling locations, both a filtered and an unfiltered sample was collected following *in-situ* measurement of water quality parameters. All unfiltered samples were collected directly from the surface water body using the dedicated laboratory-provided containers. All filtered surface water samples were collected using a peristaltic pump and Teflon-lined polyethylene tubing. Filtered fractions were collected with the addition of a 0.45 micrometer filter at the end of the Teflon-lined polyethylene tubing prior to sample collection. Samples were collected by facing upstream, and where possible from the stream bank, and were collected from downstream to upstream locations in order to minimize potential disturbance of creek bottom sediments.

Each surface water sample was packaged, documented on the laboratory chain of custody, and shipped to and/or picked up by the designated laboratory for analysis.

#### **2.2.4 Sediment Samples**

Sediment samples were co-located with the surface water samples. Three of the sediment sample locations were located within the SBAC downstream of Area W and one location was upstream of Area W where English Creek Road crosses the SBAC (Figure 2-1). In addition, two

background sediment sample locations were located within the SBAC upstream of where English Creek Road crosses the SBAC (Figure 2-2). A total of six sediment samples plus one QA/QC sample were collected and analyzed for VOCs, SVOCs, pesticides, PCBs, metals, cyanide, low level mercury, methyl mercury, grain size, total solids, and TOC. A summary of the sediment samples is provided in Table 2-8.

After each surface water sample was collected, sediment samples were collected utilizing a hand auger with a 4-inch diameter sediment bucket auger. Sediment samples were collected from the 0.0 to 0.5-foot depth interval and placed into a disposable aluminum pan.

Prior to homogenization, an aliquot of sediment was collected for VOC analysis via Encore sampler. The sediment was then homogenized by dividing the soil in the pan into four quadrants. Beginning with the upper left quadrant, each quadrant was mixed into the adjacent quadrant in a clock-wise motion using a disposable plastic trowel. The sediment was placed into a clean, appropriately sized sample container. The sample was packaged, documented on the COC, and picked up by courier or shipped to the appropriate laboratory.

### **2.2.5 Deviations from the Workplan**

Some deviations were made to certain aspects of the *Combined Work Plan and Sampling and Analysis Plan - Site Investigation at Area W* (Weston, 2011) due to conditions encountered in the field. In addition, some deviations from NJDEP-approved soil sampling methodology were made during field activities. Table 2-9 summarizes these deviations. The actual methods used were described above.

## **2.3 DATA USABILITY**

### **2.3.1 Data qualifiers**

Below is a summary of the data qualifiers that were used by the analytical laboratory or data validator to flag non-routine analyses or results. This summary contains a broad overall discussion of general data validation qualifications. A complete summary of the data qualifiers is contained in the case narrative in each of the Analytical Reports.

Compounds that were not detected (or below the method detection limit) were designated as “U”. The numeric value in the table represents the reporting limit for that compound within that sample. For organic analysis, the quantitation limit defines the reporting limit. For metal analysis, the reporting limit is the instrument detection limit (IDL). It should be noted that by definition the IDL is independent of sample preparation process but in practice the laboratory reported the sample-specific IDL after correcting it with sample weight used for preparation, final digestate volume, and the sample solid content (where applicable).

The “B” qualifier was applied to an organic result by the lab when that analyte was detected in both a sample and its associated method blank. It was applied to metal results when the concentration of an analyte was less than the project-specified quantitation limit but greater than the corrected IDL.

The designation “J” represents estimated results. The estimation could be due to the concentration of a target analyte being less than the corresponding reporting limit or due to the non-compliant quality control (QC) results.

An “R” designation was applied when QC non-compliances render the data unusable. This was the case when the presence or absence of a given compound could not be determined, or when the corresponding values in the tables were quantitatively unreliable.

### **2.3.2 Data Validation**

Per the Final Area W QAPP (Weston, 2011a), one sample from each media (soil, groundwater, surface water, and sediment) was fully validated for all analytical methods by a Weston data validator. The data validation checklist and assessment report are found in Appendix F. The data reported within this SI report include those data and qualifiers that have been validated.

Of the samples collected from this site, the following samples were evaluated.

Soil – AW-P1-SS-008-01-01-1  
Sediment – AW-P1-SD-006-01-01-1  
Surface Water – AW-P1-SW-006-01-01-1  
Ground Water – AW-P1-GW-001-01-AA1

These samples were reviewed by following U.S. Environmental Protection Agency (EPA) Region II Data Validation Standard Operating Procedures (SOPs) pertinent to requested analyses of volatile organics (VOC), semi-volatile organics (SVOC), pesticides, polychlorinated biphenyls (PCB), and metals including mercury and cyanide. A data review consisting of field documentation such as Chain-of-Custody forms, sample preservation, data deliverable completeness check, analytical holding times, laboratory quality control (QC) results, and instrument performances was performed for the aforementioned samples. The only notable findings are summarized in the following discussions.

1. Due to high moisture content (60%) in sediment sample AW-P1-SD-006-01-01-1, all analytical results were estimated for positive results (J) and non-detected results (UJ).
2. Due to extremely weak instrument response for 2-butanone (the relative response factor <0.05) observed in the VOC analysis, the non-detected 2-butanone results reported for AW-P1-SS-008-01-01-1 and AW-P1-SD-006-01-01-1 were rejected (R) for potential false negative. It should be noted that this potential false negative also affects sample AW-P1-SS-008-01-02-1, AW-P1-SS-007-01-01-1, and AW-P1-SS-007-01-02-1 that were not part of the data review process.

Other than the potential false negative 2-butanone results observed for these referenced samples, all other QC performances were either acceptable or, when not compliant to lab-established limits, resulted in estimated analytical results. Based on the fact that 2-butanone is only one out of 53 target analytes (<2%) in the VOC analysis, it was determined that the lab performance was acceptable and that a review of more data deliverables was unnecessary.

## **2.4 SCREENING LEVEL RISK ASSESSMENTS**

### **2.4.1 Human Health**

In accordance with the approved *Combined Work Plan and Sampling and Analysis Plan for Area W* (Weston, 2011a), all site soil and groundwater data were compared to the EPA RSLs (May, 2012 update) and MCLs (if lower than RSLs for tapwater). In addition, at the request of NJDEP, soil and groundwater results were compared to the NJ Groundwater Quality Standards (GWQS) and Soil Remediation Standards (SRS). Tables 2-10, 2-12, 2-13, and 2-15 present all screening criteria utilized for soil, groundwater, surface water, and sediment samples, respectively. This

screening was conducted as part of the analytical results review and the results reported in Sections 3.2 and 5.1.

## **2.4.2 Ecological**

In accordance with the approved *Combined Work Plan and Sampling and Analysis Plan for Area W* (Weston, 2011a), all site soil, surface water and sediment data were compared to the NJDEP Ecological Screening Criteria and the lowest ecological benchmarks listed below. Tables 2-11, 2-14, and 2-16 present all ecological screening criteria utilized for soil, surface water, and sediment samples, respectively.

### Soil Benchmarks

- NJDEP Ecological Soil Screening Criteria, and
- USEPA Ecological Soil Screening Levels (Eco-SSLs) for plants, mammals, invertebrates, and birds, 2005.

### Sediment Benchmarks

- USEPA Region 3. 2004. Region 3 BTAG screening levels.
- Ontario Ministry of Environment and Energy (OMEE). 1993. Guidelines for the protection and management of sediment quality in Ontario. ISBN 0-7729-9248-7. 27 pp.
- Jones, D.S., G.W. Suter, & R.N Hill. 1997 Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision. Oak Ridge National Laboratory. ES/ER/TM-95/R4, Oak Ridge National Laboratory, Oak Ridge, TN.
- Long et al. 1995. Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. (ER-L values).
- USEPA Region 5, RCRA - Ecological Screening Tables,  
<http://www.epa.gov/Region5/rcrac/edql.htm>.

### Surface Water Benchmarks

- USEPA. April 2009. National Recommended Water Quality Criteria.
- Suter, G.W. & C.L. Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. - Secondary Chronic Values only
- USEPA Region 3. 1995. Revised Region 3 BTAG screening levels. Memorandum from R.S. Davis to Users. 9 August. Flora and Fauna values unless noted

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## **SECTION 3**

### **INVESTIGATION RESULTS**

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### **3 INVESTIGATION RESULTS**

#### **3.1 SITE RECONNAISSANCE RESULTS**

##### **3.1.1 Site Reconnaissance**

The boundary and grid survey identified that the eastern half of the site was used at some point as a sand borrow pit and had 3 to 4 feet of surficial soil removed. It appears this sand removal had taken place at least 10 years ago as the excavated area had trees at least 10 to 15 years old. The western portion of the site appeared to be at the native ground surface height based on the similar size/age of trees compared to the surrounding area.

Only one area of metallic debris was identified during the site reconnaissance (confirmed during the underground utility survey). The metallic debris associated with this approximately two foot by two foot area consisted of two partially buried and rusted bed springs. This location was selected as a sampling location (AW-P1-SS-004). Otherwise, only sparsely scattered glassware, bottles, and crockery were noted throughout the western portion of the site (photos are located in Appendix E). Aside from the one sample location placed at the area where metallic debris was identified, and absent other indications of potential contamination, the remaining five sample locations were distributed across the site and were selected on the basis of topographic low areas that would be expected to collect surficial contamination. Sample locations were documented using a Trimble pro-XRS GPS (Figure 2-1).

##### **3.1.2 Underground Utilities Survey**

No utility mark-outs were made at the site in reference to the One-Call. Additionally, the private underground utilities locator (Enviroscan) did not identify any utilities within Area W (Appendix C). Enviroscan noted only one metallic disturbance which was also the location detected during the Weston magnetometer survey during the site reconnaissance (location AW-P1-SS-004). Finally, FAA's facilities Center Operations and Maintenance Services and their contractor (All Star Services) did not report any knowledge of utilities at the site.

One underground utility was identified running roughly parallel with the north side of the southern boundary road near background soil/groundwater location AW-P1-SS-007 (Appendix C).



### **3.1.3 Air and Radiological Monitoring**

Ambient air monitoring was conducted both prior to and during active phases of the work and did not indicate any VOCs or mercury vapors at the site or background locations.

Monitoring for radiation utilizing a Micro/R did not indicate radiation exposure rates at the site or background locations ranging near or above the Technical Center background of four to five microrem per hour based on the results of the Radiological Scoping Survey of the FAA William J. Hughes Technical Center (TRC, 2007).

## **3.2 ANALYTICAL RESULTS**

Tables 3-1 through 3-4 contain a summary of the analytical results exceeding criteria in soil, groundwater, surface water, and sediment samples collected as part of the Area W SI. Compounds that were not detected in any of the samples (on a per matrix basis) and that did not exceed criteria were not included in the tables. All analytical data are provided in Appendix G and laboratory reports are provided in Appendix H. A list of compounds that were not detected at concentrations above applicable criteria is found in Appendix I and includes the compounds where the laboratory method detection limit (MDL) exceeded the lowest applicable screening criteria. The QAPP (Weston, 2011) included Table 3-1 which identified a number of compounds that were expected to have detection limits that exceeded the lowest criteria. The remainder of the compounds that were measured with detection limits exceeding criteria was due to matrix issues (i.e., elevated moisture) within one or more samples that resulted in elevated detection limits. Based on the highly conservative approach of screening against the strictest available criteria, non-detection of compounds at all sample locations at these low levels does not suggest contamination and additional sampling is not proposed.

The analytical results for the Area W SI were compared to applicable United States Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) (May 2012 update) and secondarily to applicable New Jersey Department of Environmental Protection (NJDEP) criteria. A summary of the applicable criteria was provided in Table 3-1 of the Final Area W Quality Assurance Project Plan (QAPP) (Weston, 2011). Compounds with exceedances of EPA and secondarily to NJDEP criteria were also compared to the maximum concentrations detected in the site background samples (Tables 3-1 through 3-4).

The results of this investigation are described below.

### **3.2.1 Soil**

Table 3-1 presents a comparison of the soil sample analytical results to the EPA RSLs as well as the strictest of NJDEP non-residential direct contact (NRDSRS), residential direct contact (RDCSRS), and impact to groundwater soil screening criteria (IGWSRS). Exceedances of these criteria are shown on Figure 3-1.

Benzo(a)pyrene (four of the twelve samples collected within Area W boundaries) and dibenz(a,h)anthracene (one of the twelve samples collected within Area W boundaries) were the only analytes that exceeded strictest of EPA industrial and residential soil Regional Screening Levels (RSL) criteria (May, 2012 revision).

Concentrations of arsenic and chromium were detected above the strictest EPA soil criteria in almost all samples, but were all below NJDEP soil criteria in all cases. Alpha-BHC (one of the thirteen samples collected from within Area W boundaries) and Aluminum (ten of the thirteen samples collected from within Area W boundaries) were the only other compounds detected at concentrations greater than the most stringent NJDEP soil remediation standards. These concentrations were below EPA soil criteria. In the case of aluminum, six samples exceeded the maximum concentration measured at the background location but did not exceed the EPA soil criteria. Although disposable aluminum pans and disposable plastic trowels were used to homogenize the soil samples, this was unlikely to be a contributor to the aluminum and SVOC detections in the soil because the equipment blank results did not have any detections of these compounds (Appendix H).

### **3.2.2 Groundwater**

Table 3-2 presents a comparison of the groundwater sample analytical results to the lower of EPA maximum contaminant levels (MCLs) or RSLs for tapwater, as well as the NJDEP practical quantitation limits (PQLs). Exceedances of these criteria are shown on Figure 3-2.

#### **3.2.2.1 Chloroform**

Chloroform was detected at a concentration greater than the EPA RSP for tapwater at four site locations. Two site groundwater samples and one of the background groundwater samples had

concentrations of chloroform above the NJDEP PQL (1.0 ug/l). At only one location (AW-P1-GW-006) was chloroform detected at a concentration (3.3 ug/l) exceeding the NJDEP PQL as well as the maximum background concentration (2.5 ug/l).

#### *3.2.2.2 Bis(2-ethylhexyl)phthalate*

Bis(2-ethylhexyl)phthalate was detected at one site location and one background location at a concentration greater than the EPA RSL for tapwater. Both samples measured 1.1 ug/L.

#### *3.2.2.3 Metals*

Concentrations of five metals (aluminum, arsenic, chromium, iron, and lead) exceeded the lower of EPA RSLs for tapwater or MCLs. The criteria for aluminum and iron are secondary MCLs which are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health and are not enforceable.

A number of metals (aluminum, arsenic, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, sodium, zinc, and cyanide) were detected in site groundwater samples above the NJDEP PQLs. Of those, all but cyanide were detected at higher concentrations in on-site samples than in the background groundwater samples. The majority of the metals exceedances of both NJDEP PQLs and the background concentrations were found at locations AW-P1-GW-004 and AW-P1-GW-005 which were the two locations with the highest turbidity as noted in the laboratory reports. At these two locations, samples exhibited aluminum, arsenic, chromium, iron, and lead, at concentrations above the lower of EPA RSLs for tapwater (or MCLs), NJDEP PQLs and the maximum background concentrations.

Review of the metals results at temporary well point locations AW-P1-GW-004 and AW-P1-GW-005 showed concentrations for almost all detected metals were elevated well above the ranges seen in all of the other site and background wells. Despite efforts to minimize turbidity during the collection of groundwater samples (see Section 2.2.3), the laboratory digestion logs (Appendix J) and elevated detection levels (Appendix H) for these samples indicate that turbidity was elevated in these two unfiltered samples and may be responsible for the elevated metals concentrations measured in these two temporary well points. This is further supported by the fact that these elevated levels of metals (i.e., above the comparison criteria) were measured at

lower concentrations in the other 4 site groundwater samples which were collected from temporary well points located within 200 feet including downgradient locations.

### **3.2.3 Surface water**

Table 3-3 presents the comparison of surface water sample analytical results to the lowest of EPA National Recommended Water Quality Criteria (NRWQC) (lowest of the human health, CMC and CCC values) as well as the NJDEP Surface Water Quality Criteria for Toxic Substances (SWQC) (lowest of human health, chronic, and acute values). Exceedances of these criteria are shown on Figure 3-3.

Concentrations of bis(2-ethylhexyl) phthalate, arsenic, and mercury exceedanced EPA NRWQC values. Of those, only concentrations at location SW-002 also exceeded maximum background concentrations.

In three surface water samples at two locations (AW-P1-SW-002 and AW-P1-SW-003), bis(2-ethylhexyl) phthalate concentrations exceeded the NJDEP SWQC (1.2 ug/L) and the maximum background levels (1.6 ug/L) with concentrations up to 5.5 ug/L. Arsenic was detected at concentrations above the NJDEP human health SWQC (0.017 ug/L) in both filtered and unfiltered surface water samples at all locations, although only location AW-P1-SW-002 had a concentration greater than that found at the background location. Mercury concentrations (by both standard and low-level analysis) in the unfiltered surface water sample (0.46 ug/L) at AW-P1-SW-002 were detected above NJDEP SWQC and the maximum background concentrations.

### **3.2.4 Sediment**

Table 3-4 presents the comparison of sediment sample analytical results to the lowest of EPA soil RSL criteria as well as the NJDEP lowest effect level (LEL) sediment screening criteria. Exceedances of these criteria are shown on Figure 3-4.

Concentrations of, benzo(a)pyrene, diben(a,h)anthracene, arsenic, chromium, mercury, and thallium were detected at concentrations exceeding the EPA sediment criteria. Cyanide was detected in a background sample location exceeding the EPA criteria.

Concentrations of SVOCs, PAHs, pesticides, and metals were detected at concentrations exceeding the NJDEP LELs at scattered locations with most of those concentrations also greater

than those measured at the background locations. PAH concentrations exceeding NJDEP LELs were found primarily just downstream of English Creek Road (AW-P1-SD-004), while pesticide concentrations exceeding NJDEP LELs were found in the swale that drains the Building 170 parking lot (AW-P1-SD-002) and AW-P1-SD-004. A copper concentration exceeding the NJDEP LEL was found in the downstream main SBAC channel (AW-P1-SD-001) while mercury at a concentration exceeding the NJDEP LEL was found at AW-P1-SD-002 (13.7 mg/kg). Although disposable aluminum pans and disposable plastic trowels were used to homogenize the sediment samples, this was unlikely to be a contributor to the SVOC detections in the sediment because the equipment blank results did not have any detections of these compounds (Appendix H).

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## **SECTION 4**

### **DATA SUMMARY**

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## **4 SUMMARY**

### **4.1 SITE RECONNAISSANCE**

Other than the sparsely scattered glassware, bottles, and crockery noted throughout the western portion of the site (see photos in Appendix E), only one small area (approximately two feet by two feet) of metallic debris was identified during the site reconnaissance which was confirmed during the underground utility survey. The surficial and deep soil, as well as groundwater was sampled at this location (AW-P1-SS-004).

#### **4.1.1 Underground Utilities Survey**

Based on the results of the One-Call, consultation with FAA's facilities Center Operations and Maintenance Services and their contractor (All Star Services), and the private underground utility survey, there is no indication of past or present utilities at the site.

#### **4.1.2 Air and Radiological Monitoring**

VOCs and mercury vapors were not detected at the site or background during at any time of the field investigation. Similarly, radiation exposure rates at the site and background locations did not measure at or above the Technical Center background of four to five microrem per hour (TRC, 2007) during any of the field activities.

### **4.2 ANALYTICAL RESULTS**

#### **4.2.1 Soil**

Analysis of the Area W soils (both surficial and directly above the groundwater table) was the primary media of concern for this investigation as any contamination would be expected to be detected on or within the soils within the site boundary. The scattered and minor exceedances of EPA or NJDEP criteria indicate marginal contamination consistent with documented regional concentrations of these compounds and do not necessitate further investigation.

The low level SVOC concentrations of benzo(a)pyrene and dibenz(a,h)anthracene detected in surficial samples above the EPA RSL and the maximum background concentration were measured at locations AW-P1-SS-003, AW-P1-SS-004, AW-P1-SS-005, and AW-P1-SS-006.

Maximum benzo(a)pyrene and dibenz(a,h)anthracene concentrations (0.0623 mg/kg and 0.0287 mg/kg, respectively) are within documented mean ambient level New Jersey urban coastal plain region soils concentrations (0.14 mg/kg and 0.03 mg/kg, respectively) as presented in *Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Urban Coastal Plain Region Soils* (Table 9 - BEM Systems, 1998). Additionally, the benzo(a)pyrene concentration is within documented 95<sup>th</sup> percentile level of New Jersey rural coastal plain background concentrations (0.069 mg/kg) as presented in *Characterization of Ambient Levels of Selected Metals and CPAHs in New Jersey Soils: Year III – Rural Areas of New Jersey, Highlands, Valley and Ridge, and Coastal Plan Physiographic Provinces* (Table 17 - BEM Systems, 2002).

The one isolated surficial sample (AW-P1-SS-004) where the alpha-BHC concentration that exceeded NJDEP IGWSRS did not exceed EPA soil RSL. The measured concentration (0.0068 mg/kg) is within the detected range of measured alpha-BHC concentrations (0.004 – 0.009 mg/kg) as presented in *A Summary of Selected Soil Constituents and Contaminants at Background Locations in New Jersey* (Table 11 - NJDEPE, 1993).

While not detected in exceedance of EPA RSLs or NJDEP residential and non-residential criteria, aluminum concentrations at six samples at four locations exceeded the NJDEP impact to groundwater criteria (3,900 mg/kg) and the maximum background concentration. Aluminum is a naturally occurring metal often associated with clays, which are present in the site soils. Additionally, the aluminum concentrations detected at the site (up to 14,300 mg/kg) are within documented ambient level New Jersey coastal plain background concentrations (up to 17,400 mg/kg) as presented in *Characterization of Ambient Levels of Selected Metals and CPAHs in New Jersey Soils: Year III – Rural Areas of New Jersey, Highlands, Valley and Ridge, and Coastal Plan Physiographic Provinces* (Table 14 - BEM Systems, 2002). As discussed in section 3.2.1, although disposable aluminum pans and disposable plastic trowels were used to homogenize the soil samples, this was unlikely to be a contributor to the aluminum and SVOC detections in the soil because the equipment blank results did not have any detections of these compounds (Appendix H).

Concentrations of arsenic and chromium were detected in most site samples above the lowest EPA RSL (none exceeded the lowest NJDEP criteria) and many were also higher than the



maximum detected background concentration. However, arsenic and chromium are also measured at elevated concentrations in rural areas of the coastal plain. The arsenic concentrations detected at the site (up to 6.4 mg/kg) and chromium concentrations detected at the site (up to 14.8 mg/kg) are within documented ambient level New Jersey coastal plain background concentrations (up to 14.4 mg/kg and 21.2 mg/kg, respectively) as presented in *Characterization of Ambient Levels of Selected Metals and CPAHs in New Jersey Soils: Year III – Rural Areas of New Jersey, Highlands, Valley and Ridge, and Coastal Plain Physiographic Provinces* (Table 14 - BEM Systems, 2002).

#### **4.2.2 Groundwater**

Groundwater is the secondary media of concern and would be expected to indicate downward migration of any soil contamination that may be present. Of the six compounds detected in soils above the lowest applicable criteria, aluminum, arsenic and chromium were detected in groundwater at concentrations exceeding the lowest applicable criteria. While some exceedances of groundwater criteria are noted, other local sampling results and additional information on the groundwater samples (i.e., turbidity issues) indicates there is little, if any, evidence of contamination within the Area W groundwater.

##### *4.2.2.1 Chloroform*

Chloroform was the only VOC detected at Area W. While chloroform was detected at a number of locations, it was only measured at a concentration (3.3 ug/l) above screening criteria and the maximum background concentration at location AW-P1-GW-006. This concentration is well below the EPA MCL (80.0 ug/l) and NJDEP class IIA GW criterion (70.0 ug/l), however, it exceeds the NJDEP PQL (1.0 ug/l) which indicates the detection is quantifiable, and also exceeds the measured background concentration (2.5 ug/l). Historic data from the Building 170 well (screened 103 – 118 ft) which is located approximately 650 feet to the south east of Area W (Figure 4-1), detected chloroform at a concentration of 3.6 ug/l (TRC, 2005). As can be seen on Figure 4-1 and Table 4-1, chloroform was also detected at concentrations greater than Area W at 8 of 12 of the residential wells (up to 8.9 ug/l) along English Creek Avenue to the southwest of the site (FAA, 2006). The EPA residential well depths ranged from 85 to 123 feet below ground

surface. Local groundwater flow in the vicinity of Area W exhibits a northeasterly flow towards the SBAC (Figure 4-2).

The concentration of chloroform (3.3 ug/L) detected at location AW-P1-GW-006 is comparable to that measured at the nearby Building 170 well, as well as lower than those concentrations measured along English Creek Road (upgradient based on measured local groundwater flow). Additionally, TRC noted in previous work (TRC, 2006) that these chloroform concentrations are typical of low level chloroform detected in groundwater at the Technical Center and regionally in the Atlantic County aquifer. Discharge of chlorine-based cleaners into septic tanks/fields via chlorinated potable water can also lead to the formation of chloroform in groundwater. This may be the case at the residential properties along English Creek Road.

#### *4.2.2.2 Metals*

Five inorganics (aluminum, arsenic, chromium, iron, and lead) were detected in Area W groundwater at concentrations exceeding the EPA the lower of the MCLs or RSLs for tapwater. The criteria for aluminum and iron are secondary MCLs which are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health and are not enforceable. The majority of the other exceedances were associated with locations AW-P1-GW-004 and AW-P1-GW-005. As noted in Section 3.2.2.2 and above, elevated turbidity was noted in the laboratory digestion logs for samples AW-P1-GW-004 and AW-P1-GW-005 which may also have contributed to the elevated metals concentrations in these two groundwater samples.

Aluminum was detected at concentrations above EPA criteria and maximum background concentrations at locations AW-P1-GW-003, AW-P1-GW-004 and AW-P1-GW-005, however, only the corresponding soil location AW-P1-SS-005 showed elevated aluminum in the soil above groundwater. Similarly, arsenic was detected at concentrations above EPA criteria and maximum background concentrations at locations AW-P1-GW-002, AW-P1-GW-003, AW-P1-GW-004 and AW-P1-GW-005. Aside from the elevated concentrations at the turbid well locations (AW-P1-GW-004 and AW-P1-GW-005) the corresponding soil locations for the other samples (AW-P1-SS-002 and AW-P1-SS-003) did not exhibit elevated arsenic in the soil above

groundwater. Chromium, iron and lead were all detected at concentrations above EPA criteria and maximum background concentrations only at turbid sample locations AW-P1-GW-004 and AW-P1-GW-005.

At location AW-P1-GW-005, lead was detected at 30.5 ug/l as compared to the MCL of 15.0 ug/l. Lead was not detected in any of the Area W soil samples however; lead was detected at a depth of 123 ft bgs in the EPA residential well sample along English Creek Avenue (Figure 4-1 and Table 4-1) at a concentration (55 ug/l) that is greater than Area W (FAA, 2006). There were no exceedances of EPA RSLs for tapwater or MCLs for lead at the four Area W wells to the north (downgradient) of AW-P1-GW-005. Therefore, it could be assumed that the groundwater at AW-P1-GW-005 may be characterizing conditions upgradient based on local groundwater flow, rather than a site related issue. Additionally, as noted in Section 3.2.2.2, elevated turbidity was noted in the laboratory digestion logs for samples AW-P1-GW-004 and AW-P1-GW-005 which may also have contributed to the elevated lead measurement.

Of the metals that exceeded NJDEP PQLs and the Area W background wells, cobalt, copper, lead, manganese, mercury, sodium, and zinc were measured at levels less than the maximum concentrations detected in the English Creek Avenue residential wells sampled by EPA in 2006 (Table 4-1). However, the maximum concentrations of aluminum, arsenic, chromium, iron, and nickel measured in Area W were greater than the maximum concentrations detected in the English Creek Avenue EPA residential well samples (Table 4-1). The highest concentrations of these metals were measured in the groundwater samples from temporary well points AW-P1-GW-004 and AW-P1-GW-005 (Table 3-2) in which elevated turbidity was noted in the laboratory digestion logs and may also have contributed to the elevated metals concentrations in these two groundwater samples.

#### **4.2.3 Surface water**

There is no surface water/sediment within the Area W boundaries. As such, analysis of surface water samples, collected outside the boundaries of Area W, was conducted to determine potential for off-site migration of any contamination detected in primarily soils but also potentially groundwater from Area W. Of the compounds detected at concentrations exceeding criteria in Area W soils, only arsenic was detected in surface water at concentrations exceeding applicable

criteria (Table 3-3). Of the compounds detected at concentrations exceeding criteria in Area W groundwater, bis(2-ethylhexy)phthalate, arsenic and mercury were detected in surface water at concentrations exceeding applicable criteria (Table 3-3). The exceedances of bis(2-ethylhexy)phthalate in surface water (AW-P1-SW-002 and AW-P1-SW-003) were at least three times the concentrations measured in Area W groundwater samples and therefore not expected to be related to Area W. The surface water exceedances of arsenic that also exceeded maximum background concentrations were detected at AW-P1-SW-002 which is in the swale that (Figures 2-1 and 3-3) could be expected to receive minimal, if any, overland flow from Area W. However, concentrations of arsenic measured in Area W soil samples are within documented regional background concentrations (see Section 4.2.1). Mercury was not detected above criteria in Area W soil samples.

Figure 2-1 presents the topographic contours of Area W and the surrounding area. Any surficial runoff from the site would be in a southeasterly direction for about 300 feet along the Building 170 access road. As can be seen, this drainage ditch also drains a considerably larger area to the south and east of Area W. With respect to groundwater flow, Figure 4-2 indicates that groundwater would be expected to flow from Area W in a northeasterly direction towards the former SBAC meander and ultimately to the channelized SBAC channel, as opposed to the Building 170 drainage ditch. While arsenic was detected in Area W groundwater samples, it was only detected at concentrations above the site background samples at AW-P1-SW-002, rather than AW-P1-SW-003 as would be expected from the anticipated groundwater flow direction. Therefore, there is likely little, if any, impact from Area W to the Building 170 drainage ditch.

Only mercury was detected at a concentration (1.03 ug/l) greater than the EPA NRWQC, and this was at location AW-P1-SW-002 (Figure 3-3). This location would not be expected to receive flow from Area W. It should be noted that elevated mercury was detected in biota collected by TRC/FAA within this swale. Additionally, the mercury concentration measured at AW-P1-SW-002 is consistent with concentrations measured in surface water, seep and shallow groundwater associated with the SBAC meanders.

Arsenic concentrations exceeded both the EPA human health NRWQC and the NJDEP human health component of the Surface Water Quality Criteria for Toxic Substances (SWQC) at all surface water locations. However, only at location AW-P1-SW-002 was arsenic greater than that

measured at the background locations. As discussed above, location AW-P1-SW-002 is in a swale that would not be expected to be impacted significantly by Area W soils or groundwater.

Detected concentrations of bis(2-ethylhexyl) phthalate ranged from 1.3 to 5.5 ug/L and exceed the NJDEP SWQC (1.2 ug/L). Two of these locations (AW-P1-SW-002 and AW-P1-SW-003) had concentrations exceeding the maximum background levels (1.6 ug/L). However, bis(2-ethylhexyl) phthalate was not detected in Area W soils and was only detected in Area groundwater at a concentration of 1.1 ug/L groundwater. Therefore, there is no site impact relating to these concentrations.

#### **4.2.4 Sediment**

There is no surface water/sediment within the Area W boundaries. As such, analysis of sediment samples, collected outside the boundaries of Area W, was conducted to determine potential for off-site migration of any contamination detected in primarily soils but also potentially groundwater from Area W. Of the compounds detected at concentrations exceeding criteria in Area W soils, benzo(a)pyrene, dibenz(a,h)anthracene, arsenic, and chromium were detected in sediment at concentrations exceeding applicable criteria (Table 3-4). Of the compounds detected at concentrations exceeding criteria in Area W groundwater, bis(2-ethylhexy)phthalate, arsenic, chromium, copper, and mercury were detected in sediment at concentrations exceeding applicable criteria (Table 3-4).

Of the five SVOCs detected in sediment exceeding NJDEP criteria and maximum background concentrations, only Bis(2-ethylhexyl)phthalate was detected in groundwater of Area W; however it was measured at the same concentration as noted in the background samples. Therefore, there is no indication of impacts of these organic compounds to sediment from Area W. Of the six PAHs sediment exceeding NJDEP or EPA criteria and maximum background concentrations, only benzo(a)pyrene and dibenz(a,h)anthracene was detected in soils at Area W. It should be noted, however, that the highest concentrations of these two PAHs were detected at location AW-P1-SD-004, which is just downstream of the English Creek Avenue crossing and is also upgradient of potential impact of Area W. Furthermore, as discussed in section 3.2.4, although disposable aluminum pans and disposable plastic trowels were used to homogenize the sediment samples, this was unlikely to be a contributor to SVOC detections in the sediment

because the equipment blank results did not have any detections of these compounds (Appendix H). Therefore, it is unlikely that these PAHs detections are related to Area W soils.

A few scattered exceedances of pesticides were noted in two of the sediment sample locations; however, no exceedances of pesticides were noted in soil or groundwater samples at Area W.

Arsenic and chromium were detected in sediment exceeding EPA criteria and maximum background concentrations and were also detected at concentrations exceeding criteria in Area W soils and groundwater. While concentrations of these two metals were measured above EPA criteria at most sediment locations, they are well below NJDEP sediment screening criteria. The EPA criteria used in this case (at the request of EPA) are residential soil criteria. The SBAC in this area is not a residential area and furthermore is unlikely to have much human interaction. A comparison to ecological-based criteria is more appropriate. As further discussed in Section 5.1.2, the concentrations of arsenic and chromium detected in SBAC sediments (1.6 mg/kg and 10.8 mg/kg, respectively) are well below the lowest ecological screening criteria (6 mg/kg and 26 mg/kg, respectively).

Copper was detected at a concentration exceeding criteria at the downstream sediment location (AW-P1-SD-001) only. The only other exceedance of copper at Area W was in the two turbid groundwater samples (AW-P1-GW-004 and AW-P1-GW-005) and is not likely site-related. Thallium was not detected at concentrations exceeding criteria in Area W soils or groundwater.

While mercury was detected at a concentration above EPA and NJDEP screening criteria in sediment at AW-P1-SD-02, there was no mercury exceeding criteria in Area W soils. There was one exceedance of mercury in Area W groundwater (0.174 ug/l at AW-P1-GW-004 which exceeded the NJDEP PQL). As such, the mercury detected in sediment at SD-002 is not likely related to Area W and will be addressed in the Area U Supplemental Remedial Investigation. Figure 4-3 provides a local perspective on mercury concentrations in sediment within the SBAC channel and former meanders downstream from Area W. Mercury was sampled for and not detected at concentrations exceeding sediment criteria both upstream and downstream of AW-P1-SD-002. However, sediment collected from a downstream SBAC meander (SB-DL-SD-002 and SB-DL-SD-003) showed similar concentrations to AW-P1-SD-002. These locations are associated with shallow groundwater seeps that discharge groundwater with elevated mercury

concentrations to the SBAC meanders. This phenomenon is further discussed in the Area U Supplemental Remedial Investigation.

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## **SECTION 5**

### **SCREENING LEVEL RISK ASSESSMENT**

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## **5 Screening Level Risk Assessment**

### **5.1.1 Screening Level Human Health Risk Assessment**

In accordance with the approved *Combined Work Plan and Sampling and Analysis Plan for Area W* (Weston, 2011a), all site soil and groundwater data were compared to the EPA RSLs (May, 2012 update). This screening was conducted as part of the analytical results review with the results reported in Sections 3.2.1 and 3.2.2. Per the results summary in Section 4, scattered and minor exceedances of EPA RSLs indicate marginal contamination consistent with documented regional concentrations of these compounds and do not necessitate further investigation. It should be noted that Area W is currently a fenced enclosure on the FAA property with limited opportunity (trespassers only) for human exposure to the site soils. Based on the information presented below, no further investigation into human health risk is warranted.

#### *5.1.1.1 Soil*

In soil, concentrations of benzo(a)pyrene (0.0623 mg/kg) and dibenz(a,h)anthracene (0.0287 mg/kg) were detected in surficial samples above the EPA RSLs (0.015 mg/kg for both compounds) and the maximum background concentration (not detected at 0.035 mg/kg). These RSL exceedances of benzo(a)pyrene are limited to four surficial sample locations. Benzo(a)pyrene exceeds the RSL at most by a factor of 4, and dibenzo(a,h)anthracene by a factor of 2 at Station AW-P1-SS-004-01. The resulting cancer risk for exposure to both of these PAHs at maximum detected concentrations would be low, at about  $6 \times 10^{-6}$ . Furthermore, the concentrations of these two SVOCs are within documented mean New Jersey urban coastal plain region soils concentrations (Table 9 - BEM Systems, 1998). Additionally, the benzo(a)pyrene concentration is within documented 95th percentile of New Jersey rural coastal plain background concentration as presented in (Table 17 - BEM Systems, 2002).

While not detected in exceedance of EPA RSLs or NJDEP residential and non-residential criteria, aluminum concentrations at six samples at four locations exceeded the NJDEP impact to groundwater criteria (3,900 mg/kg) and the maximum background concentration. Aluminum is a naturally occurring metal often associated with clays, which are present in the site soils. Additionally, the aluminum concentrations detected at the site (up to 14,300 mg/kg) are within

documented ambient level New Jersey coastal plain background concentrations (up to 17,400 mg/kg) as presented in *Characterization of Ambient Levels of Selected Metals and CPAHs in New Jersey Soils: Year III – Rural Areas of New Jersey, Highlands, Valley and Ridge, and Coastal Plan Physiographic Provinces* (Table 14 - BEM Systems, 2002). As such, it is unexpected that aluminum poses an unacceptable risk to human health in Area W soils.

Concentrations of arsenic and chromium were detected in most site samples above the lowest EPA residential soil RSL (none exceeded the NJDEP residential criteria) and many were also higher than the maximum detected background concentration. However, arsenic and chromium are also measured at elevated concentrations in rural areas of the coastal plain. The arsenic concentrations detected at the site (up to 6.4 mg/kg) and chromium concentrations detected at the site (up to 14.8 mg/kg) are within documented ambient level New Jersey coastal plain background concentrations (up to 14.4 mg/kg and 21.2 mg/kg, respectively) as presented in *Characterization of Ambient Levels of Selected Metals and CPAHs in New Jersey Soils: Year III – Rural Areas of New Jersey, Highlands, Valley and Ridge, and Coastal Plan Physiographic Provinces* (Table 14 - BEM Systems, 2002). As such, it is unexpected that arsenic and chromium pose a human health risk from Area W soils.

#### *5.1.1.2 Groundwater*

Five inorganic compounds (aluminum, arsenic, chromium, iron, and lead) detected in Area W groundwater at concentrations exceeding the EPA the lower of the MCLs or RSLs for tapwater. The majority of these exceedances were associated with locations AW-P1-GW-004 and AW-P1-GW-005. As noted in Section 3.2.2.2 and above, elevated turbidity was noted in the laboratory digestion logs for samples AW-P1-GW-004 and AW-P1-GW-005 which may also have contributed to the elevated metals concentrations in these two groundwater samples.

Aluminum was detected at concentrations above EPA criteria and maximum background concentrations at locations AW-P1-GW-003, AW-P1-GW-004 and AW-P1-GW-005, however, only the corresponding soil location AW-P1-SS-005 showed elevated aluminum in the soil above groundwater. Similarly, arsenic was detected at concentrations above EPA criteria and maximum background concentrations at locations AW-P1-GW-002, AW-P1-GW-003, AW-P1-GW-004 and AW-P1-GW-005. Aside from the elevated concentrations at the turbid well

locations (AW-P1-GW-004 and AW-P1-GW-005) the corresponding soil locations for the other samples (AW-P1-SS-002 and AW-P1-SS-003) did not exhibit elevated arsenic in the soil above groundwater. Chromium, iron and lead were all detected at concentrations above the EPA RSL for tapwater and maximum background concentrations only at turbid sample locations AW-P1-GW-004 and AW-P1-GW-005.

At location AW-P1-GW-005, lead was detected at 30.5 ug/l as compared to the MCL of 15.0 ug/l. Lead was not detected in any of the Area W soil samples however; lead was detected at a depth of 123 ft bgs in the residential well at 2319 English Creek Avenue (Figure 4-1 and Table 4-1) at a concentration (55 ug/l) that is greater than Area W (FAA, 2006). There were no exceedances of EPA MCL for lead at the four Area W wells to the north (downgradient) of AW-P1-GW-005. Therefore, it could be assumed that the groundwater at AW-P1-GW-005 may be characterizing conditions upgradient based on local groundwater flow. Additionally, as noted in Section 3.2.2.2, elevated turbidity was noted in the laboratory digestion logs for samples AW-P1-GW-004 and AW-P1-GW-005 which may also have contributed to the elevated lead measurement.

Of the metals that exceeded NJDEP PQLs and the Area W background wells, cobalt, copper, lead, manganese, mercury, sodium, and zinc were measured at levels less than the maximum concentrations detected in the English Creek Avenue residential wells (Table 4-1). However, the maximum concentrations of aluminum, arsenic, chromium, iron, and nickel measured in Area W were greater than the maximum concentrations detected in the English Creek Road residential wells (Table 4-1). The highest concentrations of these metals were measured in the groundwater samples from temporary well points AW-P1-GW-004 and AW-P1-GW-005 (Table 3-2) in which elevated turbidity was noted in the laboratory digestion logs and may also have contributed to the elevated metals concentrations in these two groundwater samples. As such, it is not expected that metals pose an unacceptable risk to human health in Area W groundwater.

#### *5.1.1.3 Surface Water*

There is no surface water/sediment within the Area W boundaries. As such, analysis of surface water samples was conducted to determine potential for human health risk from off-site

migration of any contamination detected in primarily soils but also potentially groundwater from Area W.

As presented in Section 4.2.3, of the compounds detected at concentrations exceeding criteria in Area W soils, only arsenic was detected in surface water at concentrations exceeding applicable criteria (Table 3-3). Of the compounds detected at concentrations exceeding criteria in Area W groundwater, bis(2-ethylhexy)phthalate, arsenic and mercury were detected in surface water at concentrations exceeding applicable criteria (Table 3-3).

Detected concentrations of bis(2-ethylhexyl) phthalate ranged from 1.3 to 5.5 ug/L and exceed the NJDEP SWQC (1.2 ug/L). Two of these locations (AW-P1-SW-002 and AW-P1-SW-003) had concentrations exceeding the maximum background levels (1.6 ug/L). However, bis(2-ethylhexyl) phthalate was not detected in Area W soils and was only detected in Area groundwater at a concentration of 1.1 ug/L groundwater. Therefore, there is no site impact relating to these concentrations and no related human health risk from Area W.

Arsenic concentrations exceeded both the EPA human health NRWQC and the NJDEP human health component of the Surface Water Quality Criteria for Toxic Substances (SWQC) at all surface water locations. However, only at location AW-P1-SW-002 was arsenic greater than that measured at the background locations. As discussed below, location AW-P1-SW-002 is in a swale that would not be expected to be impacted significantly by Area W soils or groundwater.

It should be noted that the majority of exceedances that also exceeded maximum background concentrations were detected at AW-P1-SW-002 which is in the swale that (Figures 2-1 and 3-3) could be expected to receive minimal overland flow from Area W. Figure 2-1 presents the topographic contours of Area W and the surrounding area. Any surficial runoff from the site would be in a southeasterly direction for about 300 feet along the Building 170 access road. As can be seen, this drainage ditch also drains a considerably larger area to the south and east of Area W. With respect to groundwater flow, Figure 4-2 indicates that groundwater would be expected to flow from Area W in a northeasterly direction towards the former SBAC meander and ultimately to the channelized SBAC channel, as opposed to the Building 170 drainage ditch. Therefore, there is likely little, if any, human health impact from Area W to the Building 170 drainage ditch.

#### *5.1.1.4 Sediment*

There is no surface water/sediment within the Area W boundaries. As such, analysis of sediment samples was conducted to determine potential for human health off-site migration of any contamination detected in primarily soils but also potentially groundwater from Area W.

Of the five SVOCs detected in sediment exceeding NJDEP criteria and maximum background concentrations (Table 3-4), only Bis(2-ethylhexyl)phthalate was detected in groundwater of Area W; however it was measured at the same concentration as noted in the background samples. Therefore, there is no indication of impacts of this organic compound to sediment from Area W and as such there is no related human health risk.

Of the six PAHs sediment exceeding NJDEP or EPA criteria and maximum background concentrations, only benzo(a)pyrene and dibenz(a,h)anthracene was detected in soils at Area W. It should be noted, however, that the highest concentrations of these two PAHs were detected at location AW-P1-SD-004, which is just downstream of the English Creek Avenue crossing and is also upgradient of potential impact of Area W. Furthermore, as discussed in section 3.2.4, although disposable aluminum pans and disposable plastic trowels were used to homogenize the sediment samples, this was unlikely to be a contributor to SVOC detections in the sediment because the equipment blank results did not have any detections of these compounds (Appendix H). Therefore, it is unlikely that these PAHs detections are related to Area W soils and there is no related human health risk.

A few scattered exceedances of pesticides were noted in two of the sediment sample locations; however, no exceedances of pesticides were noted in soil or groundwater samples at Area W.

Arsenic and chromium were detected in sediment exceeding EPA criteria and maximum background concentrations and were also detected at concentrations exceeding criteria in Area W soils and groundwater. While concentrations of these two metals were measured above EPA criteria at most sediment locations, they are well below NJDEP sediment screening criteria. The EPA criteria used in this case (at the request of EPA) are residential soil criteria. The SBAC in this area is not a residential area and furthermore is unlikely to have much human interaction. A comparison to ecological-based criteria is more appropriate. As further discussed in Section 5.1.2, the concentrations of arsenic and chromium detected in SBAC sediments (1.6 mg/kg and

10.8 mg/kg, respectively) are well below the lowest ecological screening criteria (6 mg/kg and 26 mg/kg, respectively).

Copper was detected at a concentration exceeding criteria at the downstream sediment location (AW-P1-SD-001) only. The only other exceedance of copper at Area W was in the two turbid groundwater samples (AW-P1-GW-004 and AW-P1-GW-005) and is not likely site-related and with no related human health risk. Thallium was not detected at concentrations exceeding criteria in Area W soils or groundwater.

While mercury was detected at a concentration above EPA and NJDEP screening criteria in sediment at AW-P1-SD-02, there was no mercury exceeding criteria in Area W soils. There was one exceedance of mercury in Area W groundwater (0.174 ug/l at AW-P1-GW-004 which exceeded the NJDEP PQL). As such, the mercury detected in sediment at SD-002 is not likely related to Area W and will be addressed in the Area U Supplemental Remedial Investigation. Figure 4-3 provides a local perspective on mercury concentrations in sediment within the SBAC channel and former meanders downstream from Area W. Mercury was sampled for and not detected at concentrations exceeding sediment criteria both upstream and downstream of AW-P1-SD-002. However, sediment collected from a downstream SBAC meander (SB-DL-SD-002 and SB-DL-SD-003) showed similar concentrations to AW-P1-SD-002. These locations are associated with shallow groundwater seeps that discharge groundwater with elevated mercury concentrations to the SBAC meanders. This phenomenon is further discussed in the Area U Supplemental Remedial Investigation.

### **5.1.2 Screening Level Ecological Risk Assessment**

In accordance with the approved *Combined Work Plan and Sampling and Analysis Plan for Area W* (Weston, 2011a), all site soil, surface water and sediment data were compared to the lowest ecological benchmarks listed below. Figure 5-1 presents the conceptual site model for Area W. The complete ecological screening data is found in Appendix K.

Soil is the primary media of concern with regard to ecological receptors at Area W. Concentrations of metals measured in soils of Area W that are above ecological screening are within documented background ranges. Therefore further investigation into ecological risk from this media to potential ecological receptors (insectivorous birds and mammals, omnivorous

mammals, and potentially carnivorous birds and mammals) is not warranted. Groundwater is not compared to ecological benchmarks but is evaluated in the context of potential discharge to the SBAC meander and channel to the north of Area W. Based on the absence of surface water within Area W, the focus of the ecological screening of surface water and sediment was focused on compounds exceeding ecological screening benchmarks in soil. Overland transport of compounds in soils at Area W, downgradient (south east along the building 170 access road) towards the surface water and sediment associated with the Building 170 drainage ditch and ultimately the SBAC would be a potential pathway of ecological significance at this site. As shown on Figure 5-1, potential ecological receptors within these habitats would include aquatic insects, omnivorous birds and mammals, and piscivorous birds.

Table 5-1 presents those compounds in soil that were measured at concentrations exceeding ecological benchmarks. Aluminum, chromium, iron, vanadium, and cyanide were all detected at concentrations above ecological screening benchmarks for soil. As discussed in the soil sampling results section, aluminum is both naturally occurring and detected at concentrations consistent with documented regional concentrations. Similarly, concentrations of aluminum, chromium, iron, and vanadium are all within documented ambient levels within both urban (BEM Systems, 1998) and rural coastal plain (BEM Systems, 2002) (Table 5-2). Detected concentrations of cyanide are all below the MDL with only 2 samples marginally greater than that detected at the background location. Mercury was not detected at concentrations above the ecological screening criteria in soils at Area W. Based on this information, no further investigation into ecological risk based on Area W soils is warranted.

Review of Table 5-3 and indicates that the only compound detected at concentrations exceeding ecological benchmarks in surface water that was also detected in exceedance of ecological benchmarks in Area W soils and groundwater is aluminum. However, the highest concentration of aluminum measured in surface water was at the upstream background location. As such, the concentration of aluminum measured in surface water samples is not of ecological concern related to Area W. Otherwise, only mercury was detected in surface water (AW-P1-SW-001 and AW-P1-SW-002) at concentrations exceeding ecological benchmarks and also detected in groundwater at concentrations exceeding benchmarks. However, there was only one exceedance of mercury in Area W groundwater (0.174 ug/l at AW-P1-GW-004 which exceeded the NJDEP

PQL). As such, the mercury detected in surface water is not likely related to Area W. Methyl mercury was detected in surface water (AW-P1-SW-002) at a concentration exceeding the EPA Region III BTAG freshwater screening criteria, however it was not detected at those concentrations in groundwater samples collected from Area W. Furthermore, as discussed previously, mercury will be addressed in the Area U Supplemental Remedial Investigation. Based on this information, no further investigation into ecological risk based in SBAC surface water from Area W soil or groundwater impacts is warranted.

Table 5-4 indicates that no compounds were detected in sediment exceeding ecological benchmarks that were also detected in exceedance of human health or ecological benchmarks in Area W soils. With respect to Area W groundwater samples, only copper was detected in sediment exceeding ecological benchmarks that were also detected in exceedance of benchmarks in Area W groundwater. The elevated copper concentrations in groundwater were only noted in the two turbid groundwater samples (AW-P1-GW-004 and AW-P1-GW-005) and are not expected to impact SBAC sediment. Based on this information, no further investigation into ecological risk based in SBAC sediment from Area W soil or groundwater impacts is warranted.



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## **SECTION 6**

## **CONCLUSIONS**

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## **6 CONCLUSIONS**

The data collected in this investigation were sufficient to evaluate the nature and extent of potential contamination in soils and groundwater at Area W in order to determine whether additional investigation or action is necessary. Based on review of the collected information and data, no disposal of hazardous materials is indicated at Area W either by record or observation. Therefore, the results of this site investigation do not indicate the need for further investigation.

In addition, the secondary objective of the investigation was to determine whether there is any evidence of a relationship between Area W (i.e., as a potential source area) and previously identified mercury impacts downgradient from the site within the SBAC and Area U. Based on a review of the collected information and data, there is no indication that Area W serves as a potential source area of mercury impacts to the downgradient SBAC and Area U.

The following summary conclusions may be drawn from this investigation:

- Based on the results of the site reconnaissance, utilities survey, and air and radiological monitoring, there was no indication of contamination at Area W related to the former Department of Defense/Navy use of the site.
- The scattered and minor exceedances of EPA or NJDEP criteria in soil samples indicate marginal contamination consistent with documented regional concentrations of these compounds and do not necessitate further investigation.
- While some exceedances of groundwater criteria are noted, other local sampling results and additional information on the groundwater samples (i.e., turbidity issues) indicates there is little, if any, evidence of site related groundwater contamination within the Area W groundwater.
- Of the compounds detected at concentrations exceeding criteria in Area W soils, only arsenic (AW-P1-SW-002) was detected in surface water at concentrations exceeding applicable criteria (Table 3-3). However, arsenic concentrations in Area W soils are within documented regional background concentrations (BEM Systems, 2002). Therefore, there is no unexpected impact from Area W to surface water within the nearby SBAC.
- Of the compounds detected at concentrations exceeding criteria in Area W soils or groundwater, arsenic and chromium was detected in sediment at concentrations exceeding applicable criteria. However, arsenic and chromium concentrations in Area W soils are within documented regional background concentrations (BEM Systems, 2002).

Therefore, there is no unexpected impact from Area W to surface water within the nearby SBAC.

- Based on the results of the soil, groundwater, surface water, and sediment sample screening, there is little, if any, indication of risk to human health.
- There are no ecological risks to terrestrial receptors from soils at Area W, nor to aquatic receptors in SBAC surface water or sediment as related to Area W.
- While concentrations of aluminum, chromium, iron, and vanadium were all detected at concentrations above ecological screening benchmarks for soil, they are all within documented ambient levels within both urban (BEM Systems, 1998) and rural coastal plain (BEM Systems, 2002). Based on this information, no further investigation into ecological risk is warranted. No elevated mercury concentrations were detected in any Area W soil samples.
- Mercury was detected in one groundwater sample (GW-004) above the NJDEP PQL, however the measured concentration (0.174 ug/l) was below concentrations noted in upgradient off site wells along English Creek Road (Table 4-1) where concentrations of 0.21 and 0.58 ug/l were measured. Furthermore, concentrations of mercury have been measured in greater concentrations than GW-004 in numerous locations within the SBAC downstream of Area W. While mercury was detected at a concentration above EPA and NJDEP screening criteria in sediment at AW-P1-SD-02, there was no mercury exceeding criteria in Area W soils. As such, the mercury detected in sediment at SD-002 is not likely related to Area W and will be addressed in the Area U Supplemental Remedial Investigation.
- Based on the lack of indication of contamination at Area W related to the former Department of Defense/Navy use of the site, there is no need to update the conceptual site model as presented in the Work Plan (Weston, 2011).

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## **SECTION 7**

## **REFERENCES**

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## **7 REFERENCES**

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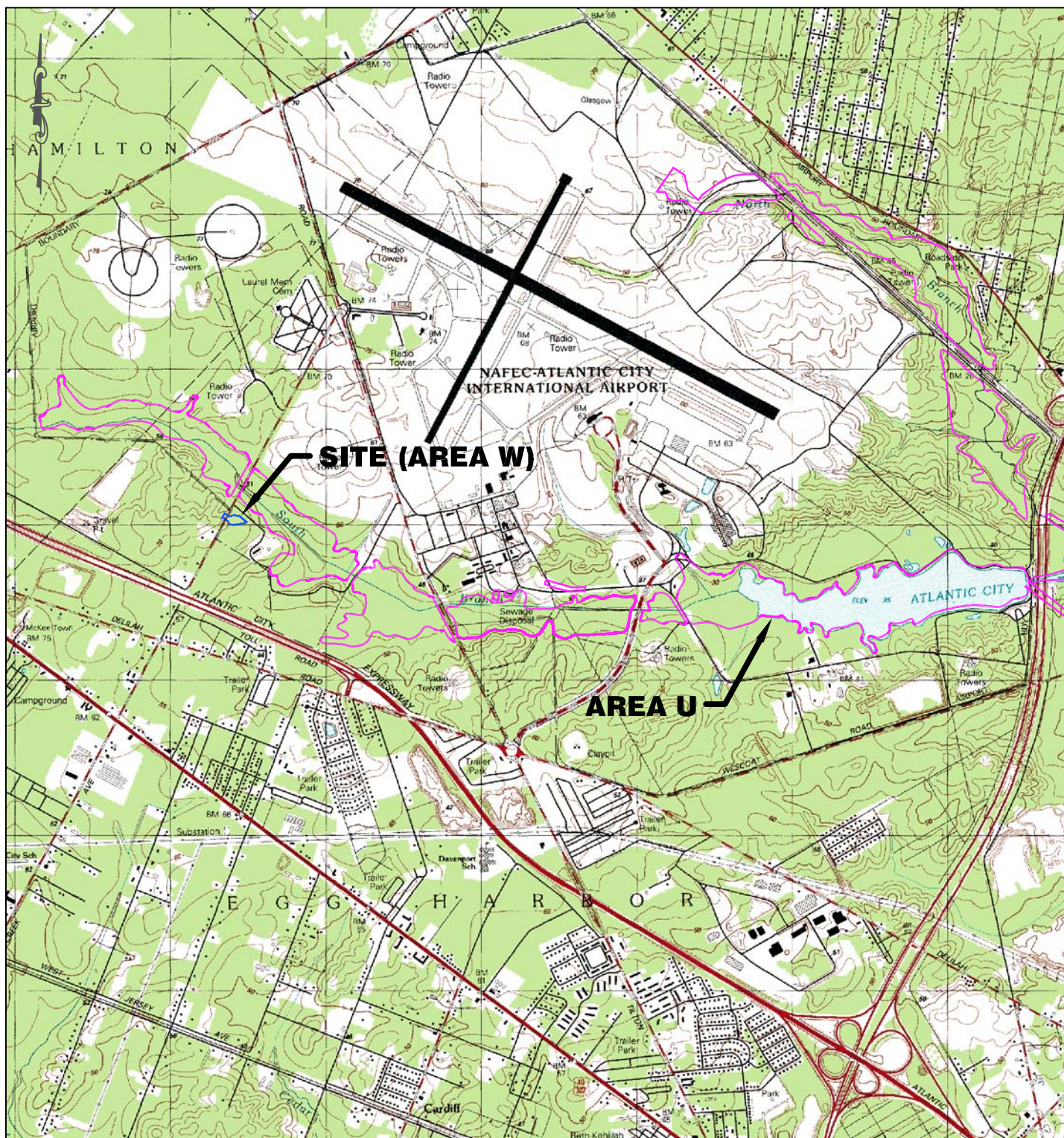
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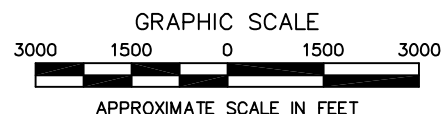
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**SOURCE:**  
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 PLEASANTVILLE, NJ, 1989



ATLANTIC CITY NAVAL AIR STATION  
 FORMERLY USED DEFENSE SITES (FUDS)  
 SITE INVESTIGATION AT AREA W  
 EGG HARBOR TOWNSHIP, NEW JERSEY

DEPARTMENT OF THE ARMY  
 NEW ENGLAND DISTRICT  
 CORPS OF ENGINEERS  
 CONCORD, MASSACHUSETTS



SITE LOCATION MAP



CONCORD

NEW HAMPSHIRE

DRAWN BEG  
 DATE DEC 2011  
 FIGURE NO. 1-1



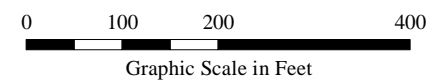
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#### Legend

- Sediment / Surface Water Sample Location
- Soil / Groundwater Sample Location
- 56 Elevation Contours (2-foot contour interval)
- Area W
- Waterway
- FAA Property Line Boundary

SCALE:



PROJECT:

AREA W SITE INVESTIGATION

CLIENT NAME:

U.S. ARMY CORPS OF ENGINEERS

TITLE:

#### SAMPLE LOCATIONS

##### AREA W

ATLANTIC CITY NAVAL AIR STATION  
FORMERLY USED DEFENSE SITE  
EGG HARBOR TOWNSHIP, NEW JERSEY



DATE:

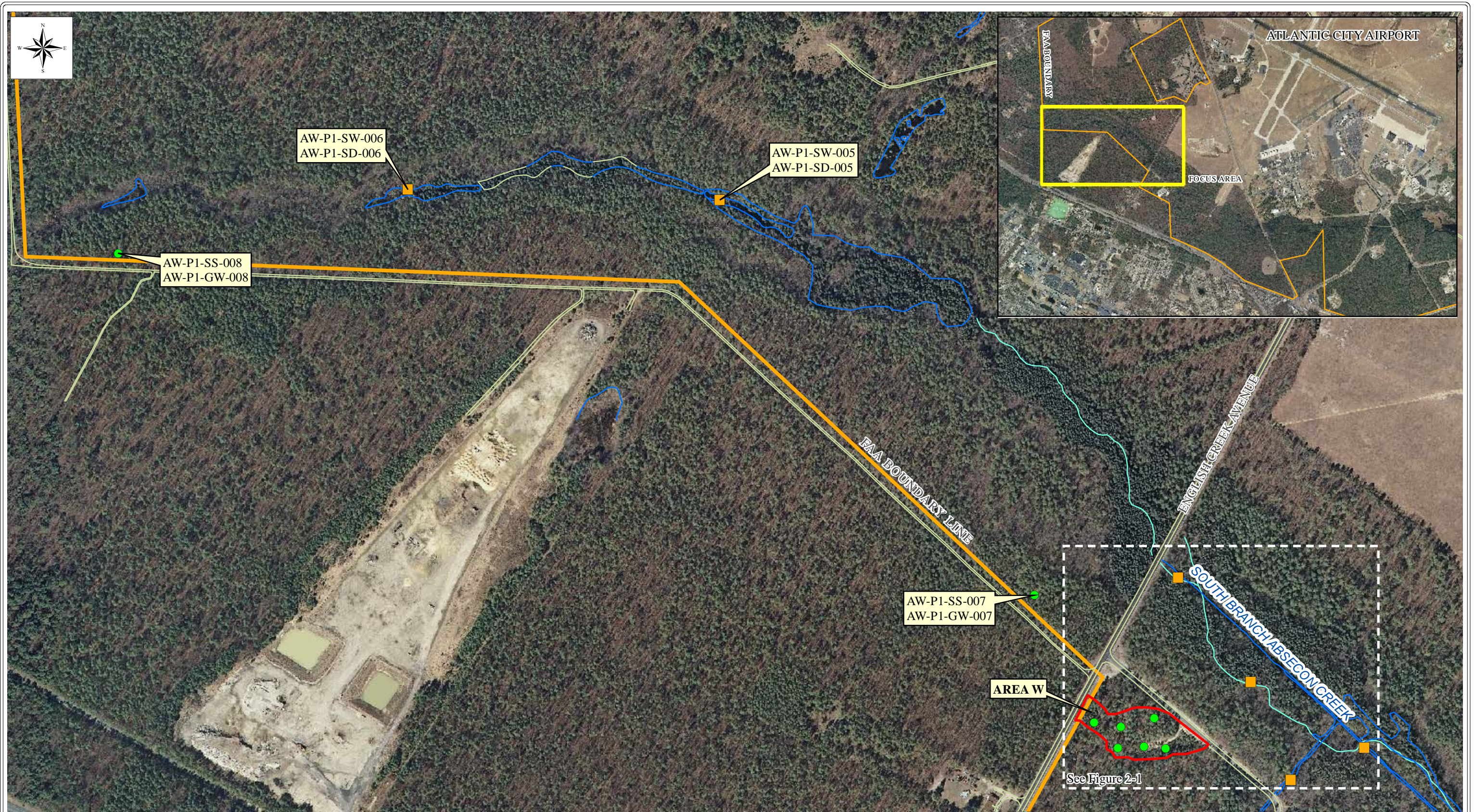
7/3/2012

FIGURE #:








2-1



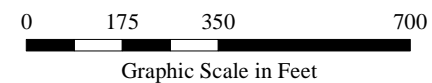
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#### Legend

- |   |  |   |                            |
|---|--|---|----------------------------|
|  | Sediment / Surface Water Sample Location |  | Roadway                    |
|  | Soil / Groundwater Sample Location       |  | FAA Property Line Boundary |
|  | South Branch Absecon Creek (Current)     |  | Area W                     |
|  | South Branch Absecon Creek (Original)    |   |                            |

SCALE:



PROJECT:

AREA W SITE INVESTIGATION

CLIENT NAME:

U.S. ARMY CORPS OF ENGINEERS

TITLE:

#### SAMPLE LOCATIONS BACKGROUND

ATLANTIC CITY NAVAL AIR STATION  
FORMERLY USED DEFENSE SITE  
EGG HARBOR TOWNSHIP, NEW JERSEY



DATE:

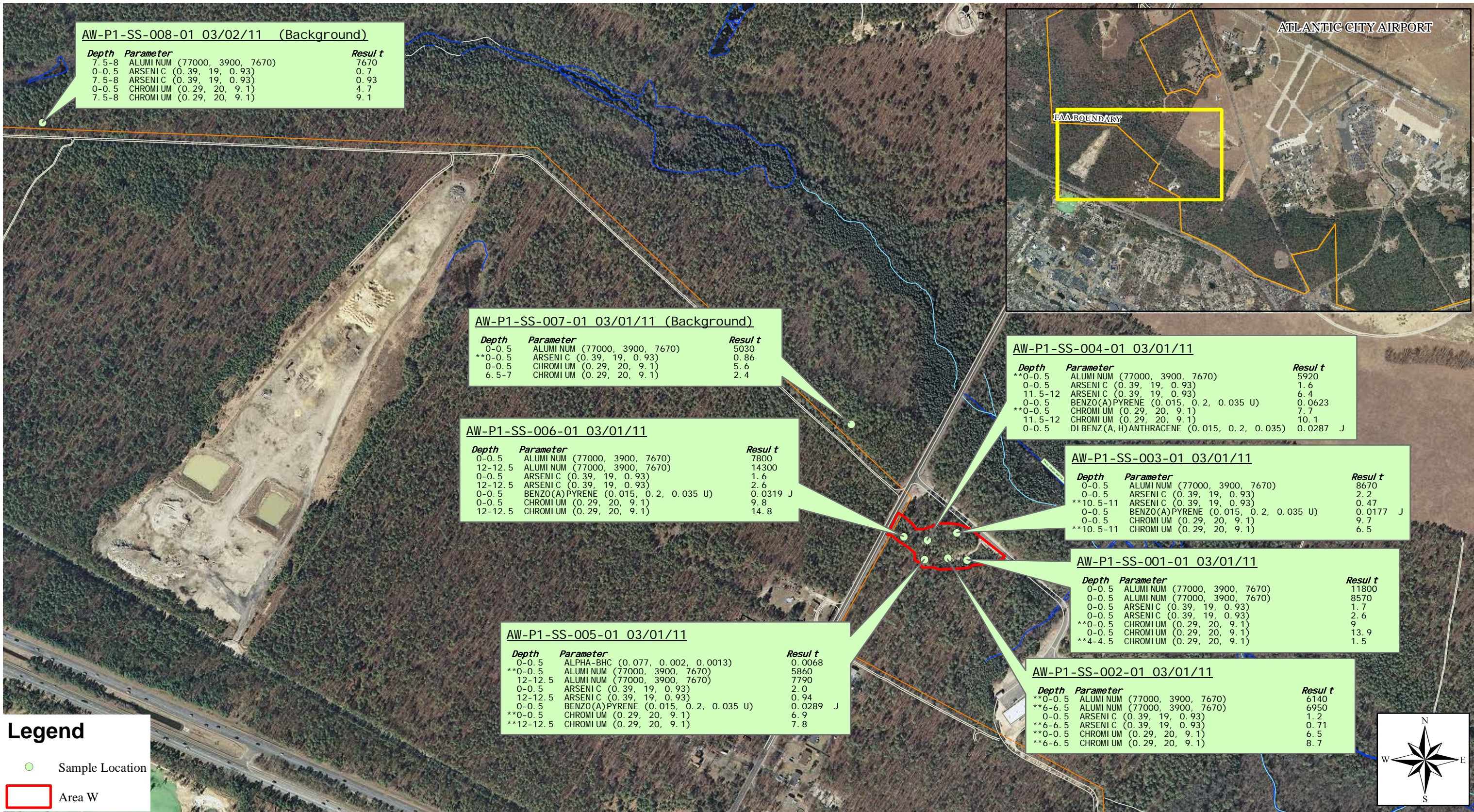
7/3/2012

FIGURE #:

2-2



P:\Atlantic City\_Reservoir\GIS\MXD\2012\_07\_AreaW\11478\_AC\_AreaW\_SS\_Exceedances.mxd



**Legend**

Sample Location

Area W

- Notes:
- Background Locations: AW-P1-SS-007-01 and AW-P1-SS-008-01.
  - \*\* - Results less than maximum background concentration.
  - Compounds listed exceed the most stringent of:
    - U.S. Environmental Protection Agency - strictest of industrial and residential soil screening criteria. Regional Screening Levels (November, 2010).
    - New Jersey Department of Environmental Protection Agency - strictest of Non-Residential Soil Remediation Standards, Residential Soil Remediation Standards and Impact to Groundwater Soil Remediation Standards
  - U - Not detected at method detection limit

Results reported in mg/kg

Field Sample ID

AW-P1-SS-004-01

Date

03/01/11

Depth	Parameter	Result
0-0.5	BENZO(A)PYRENE	0.015 0.2 0.035 U 0.0623

USEPA  
Regulatory Limit

NJDEP  
Regulatory Limit

Maximum Background  
Sample Value

SCALE:

0195390780Feet

PROJECT:

AREA W SITE INVESTIGATION

CLIENT NAME:

U.S. ARMY CORPS OF ENGINEERS

TITLE:

SOIL SAMPLE LOCATIONS  
AREA W  
ATLANTIC CITY NAVAL AIR STATION  
FORMERLY USED DEFENSE SITE  
EGG HARBOR TOWNSHIP, NEW JERSEY

WESTON  
SOLUTIONS

DATE:

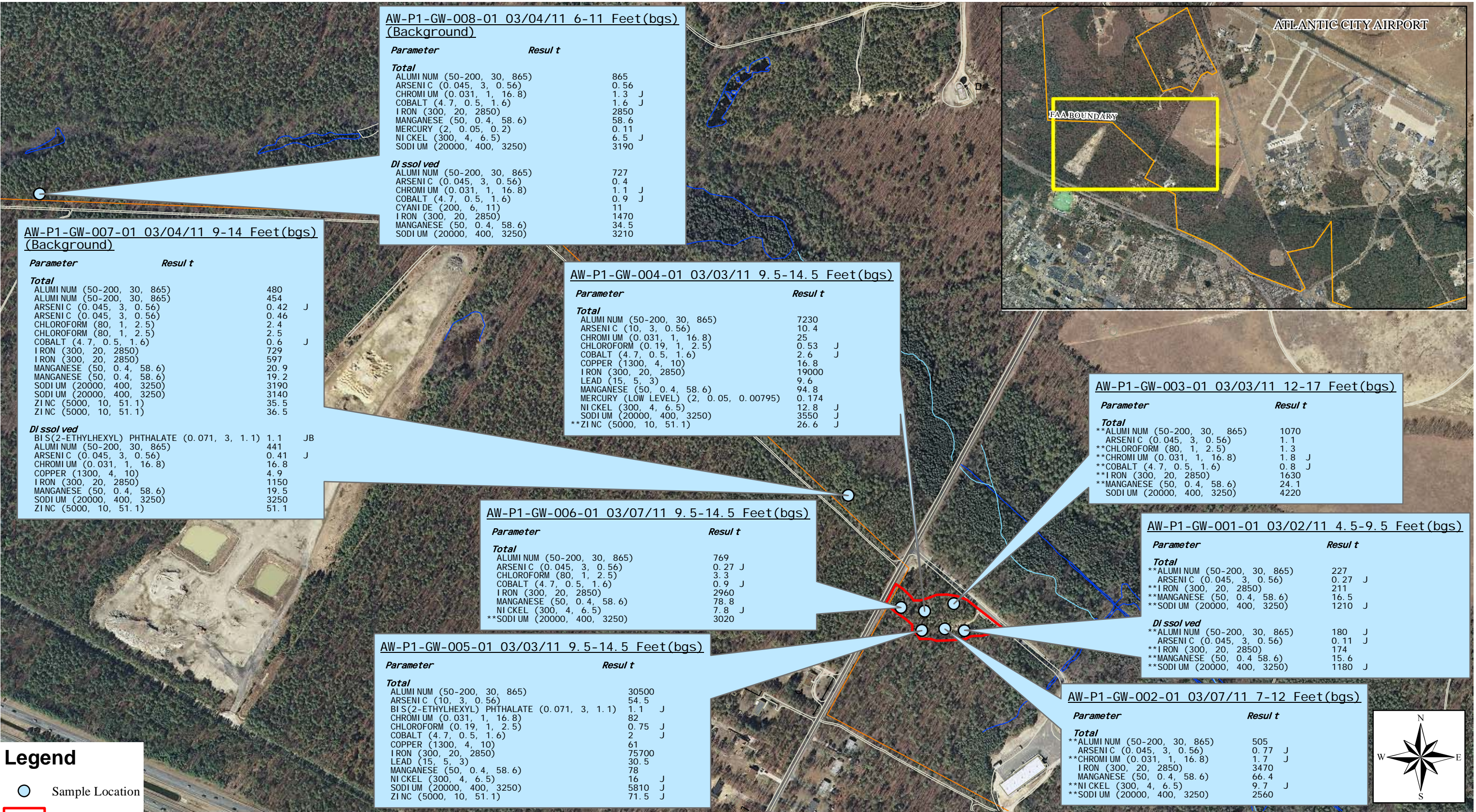
7/23/2012

FIGURE #:

3-1



P:\Atlantic\_City\_Reservoir\GIS\MXD\2012\_07\_AreaW\1479\_AC\_AreaW\_GW\_Exceedances.mxd



Legend

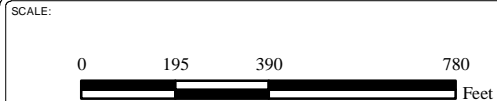
○ Sample Location

Area W

- Notes:
1. Background Locations: AW-P1-GW-007-01 and AW-P1-GW-008-01.
  2. \*\* - Results less than maximum background concentration.
  3. Compounds listed exceed the most stringent of:
    - A. U.S. Environmental Protection Agency - Maximum Contaminant Levels (MCLs)
    - B. New Jersey Department of Environmental Protection Agency - Practical Quantitation limits (PQLs)
  4. J - Estimated
  5. B - Detected in blank

Sample ID	Sample Date	Depth
AW-P1-GW-001-01	03/02/11	4.5-9.5 Feet(bgs)
Parameter	Result	
Total		
**ALUMINUM (50-200, 30, 865)	227	
Dissolved		
**ALUMINUM (50-200, 30, 865)	180 J	
USEPA Regulatory Limit		
NJDEP Regulatory Limit		
Maximum Background Sample Value		
Sample Flag		

Results reported in ug/l



PROJECT: AREA W SITE INVESTIGATION

CLIENT NAME: U.S. ARMY CORPS OF ENGINEERS

TITLE: GROUNDWATER SAMPLE LOCATIONS  
AREA W  
ATLANTIC CITY NAVAL AIR STATION  
FORMERLY USED DEFENSE SITE  
EGG HARBOR TOWNSHIP, NEW JERSEY

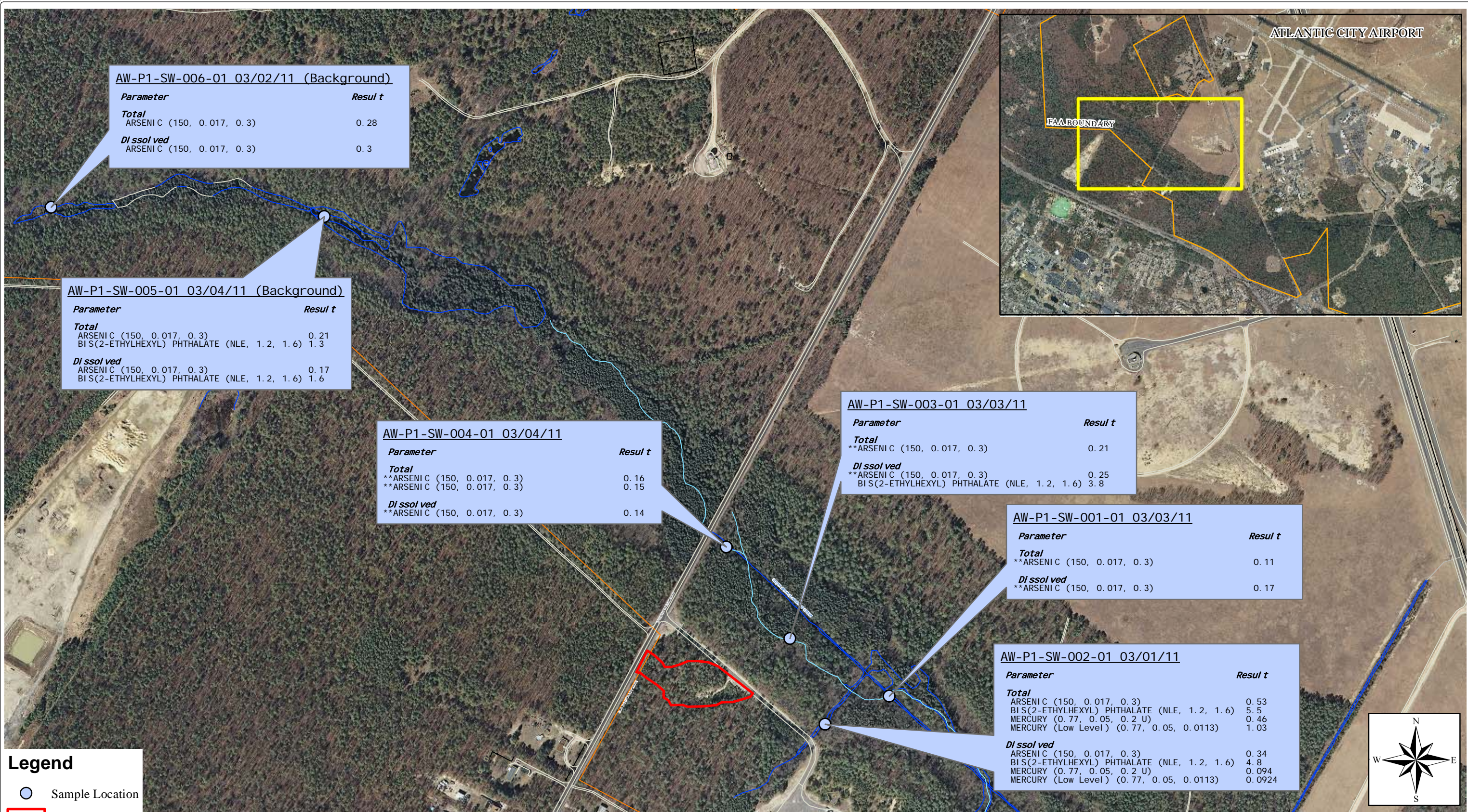


DATE: 7/23/2012

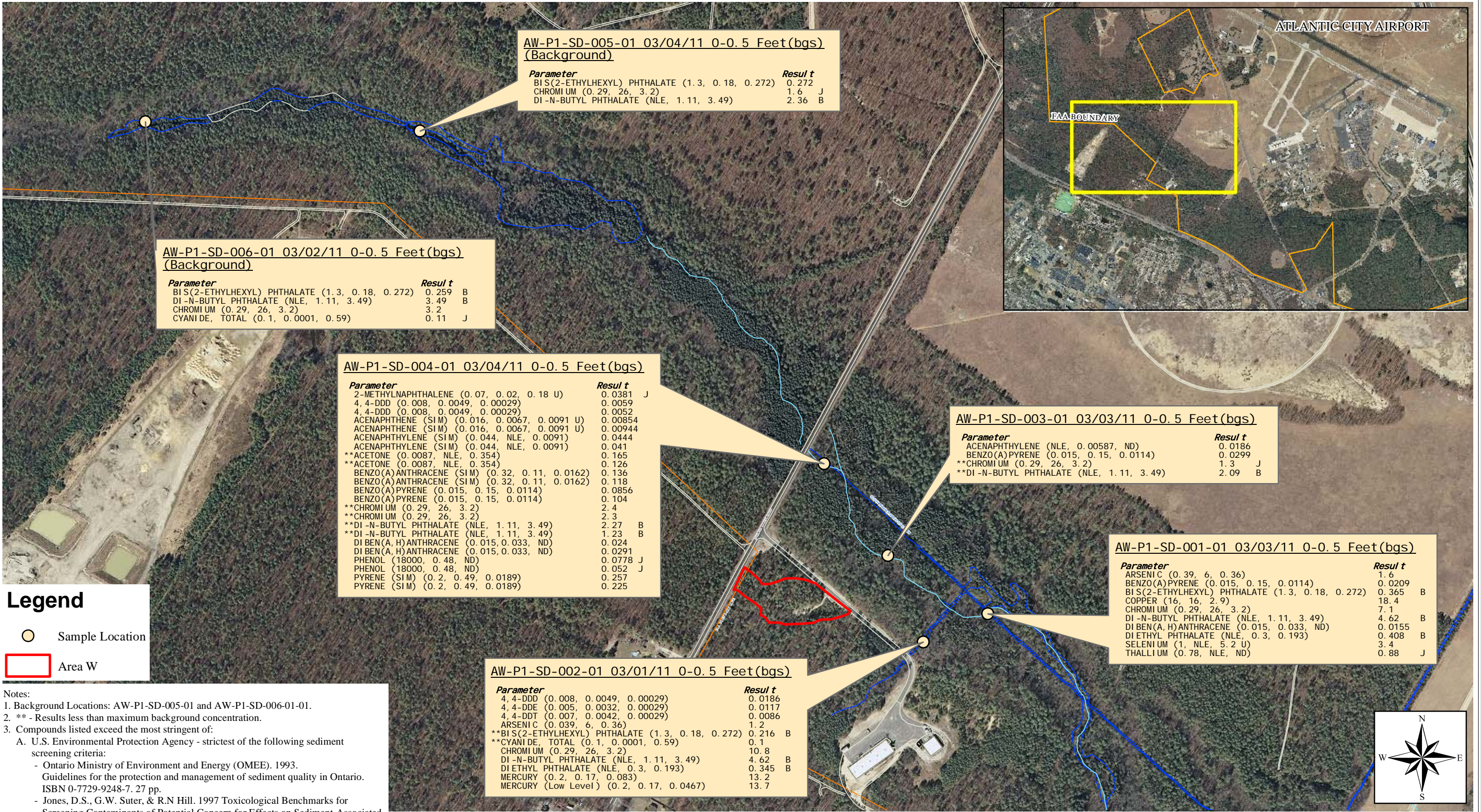
FIGURE #: 3-2



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**Legend**

○ Sample Location

Area W

- Notes:
- Background Locations: AW-P1-SD-005-01 and AW-P1-SD-006-01-01.
  - \*\* - Results less than maximum background concentration.
  - Compounds listed exceed the most stringent of:
    - U.S. Environmental Protection Agency - strictest of the following sediment screening criteria:
      - Ontario Ministry of Environment and Energy (OMEE). 1993. Guidelines for the protection and management of sediment quality in Ontario. ISBN 0-7729-9248-7. 27 pp.
      - Jones, D.S., G.W. Suter, & R.N Hill. 1997 Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision. ES/ER/TM-95/R4, ORNL, Oak Ridge, TN.
      - Long et al. 1995. Incidence of Adverse Biological Effects Within Ranges of chemical Concentrations in Marine and Estuarine Sediments. (ER-L values)
      - MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch.of Env.Cont. and Tox. 39: 20-31.
    - New Jersey Department of Environmental Protection Agency - lowest effect level (LEL) sediment screening criteria
  - B - Detected in blank
  - J - Estimated
  - U - Not detected at method detection limit

AW-P1-SD-002-01 03/01/11 0-0.5 Feet(bgs)

Parameter	Result
4,4-DDD (0.008, 0.0049, 0.00029)	0.0186
4,4-DDE (0.005, 0.0032, 0.00029)	0.0117
4,4-DDT (0.007, 0.0042, 0.00029)	0.0086
ARSENIC (0.039, 6, 0.36)	1.2
**BIS(2-ETHYLHEXYL) PHTHALATE (1.3, 0.18, 0.272)	0.216 B
**CYANIDE, TOTAL (0.1, 0.0001, 0.59)	0.1
CHROMIUM (0.29, 26, 3.2)	10.8
DI-N-BUTYL PHTHALATE (NLE, 1.11, 3.49)	4.62 B
DIETHYL PHTHALATE (NLE, 0.3, 0.193)	0.345 B
MERCURY (0.2, 0.17, 0.083)	13.2
MERCURY (Low Level) (0.2, 0.17, 0.0467)	13.7

Results reported in mg/kg

Sample ID: AW-P1-SD-006-01 03/02/11 0-0.5 Feet(bgs) (Background)

Parameter	Result
ACETONE	0.12 J

USEPA Regulatory Limit: 0.0087, NJDEP Regulatory Limit: NLE, Maximum Background Sample Value: 0.354, Sample Flag: J

SCALE: 0 200 400 800 Feet

PROJECT: AREA W SITE INVESTIGATION

CLIENT NAME: U.S. ARMY CORPS OF ENGINEERS

TITLE: SEDIMENT SAMPLE LOCATIONS  
AREA W  
ATLANTIC CITY NAVAL AIR STATION  
FORMERLY USED DEFENSE SITE  
EGG HARBOR TOWNSHIP, NEW JERSEY

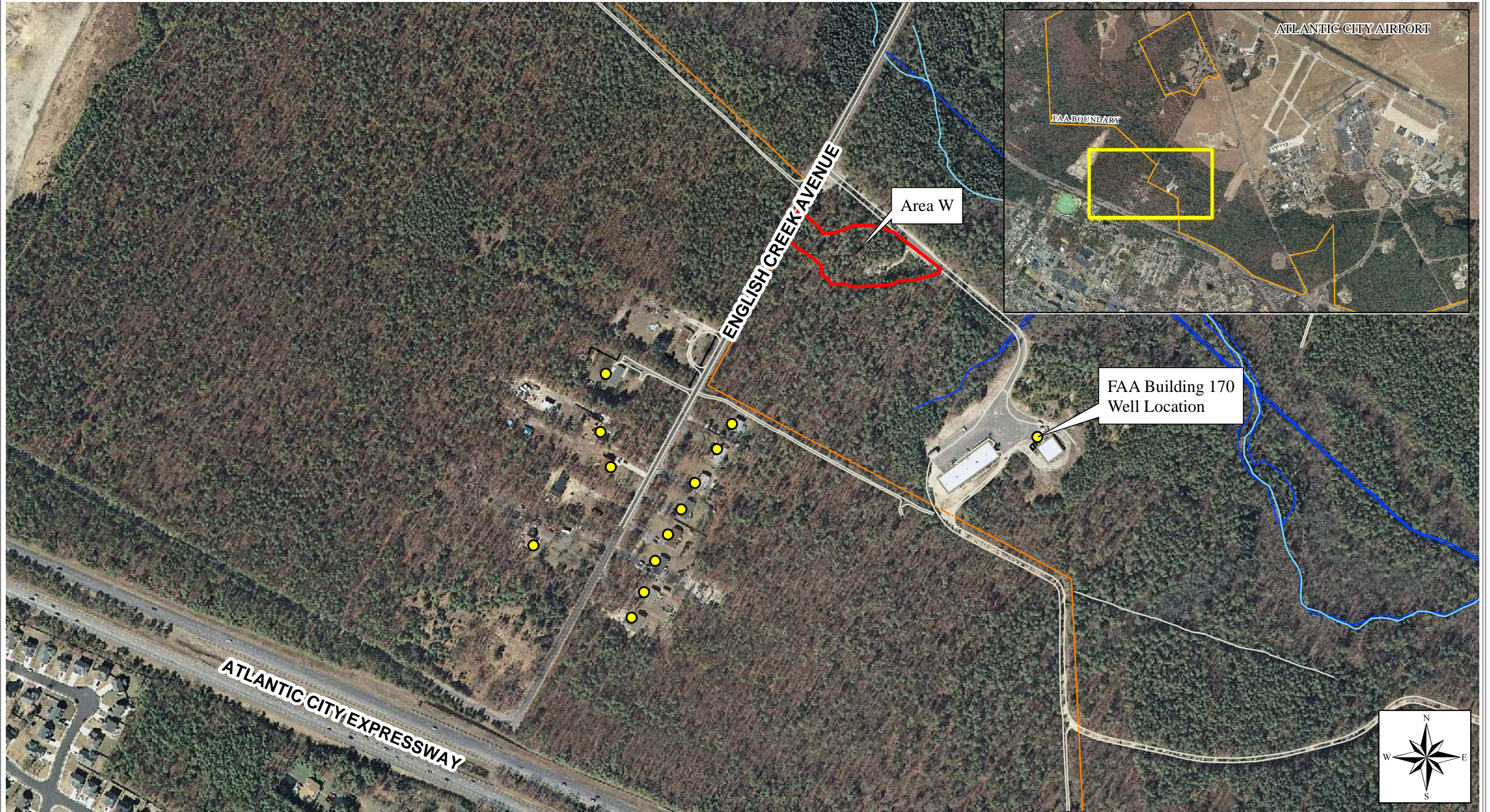
WESTON SOLUTIONS SM

DATE: 7/23/2012

FIGURE #: 3-4



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**Legend**

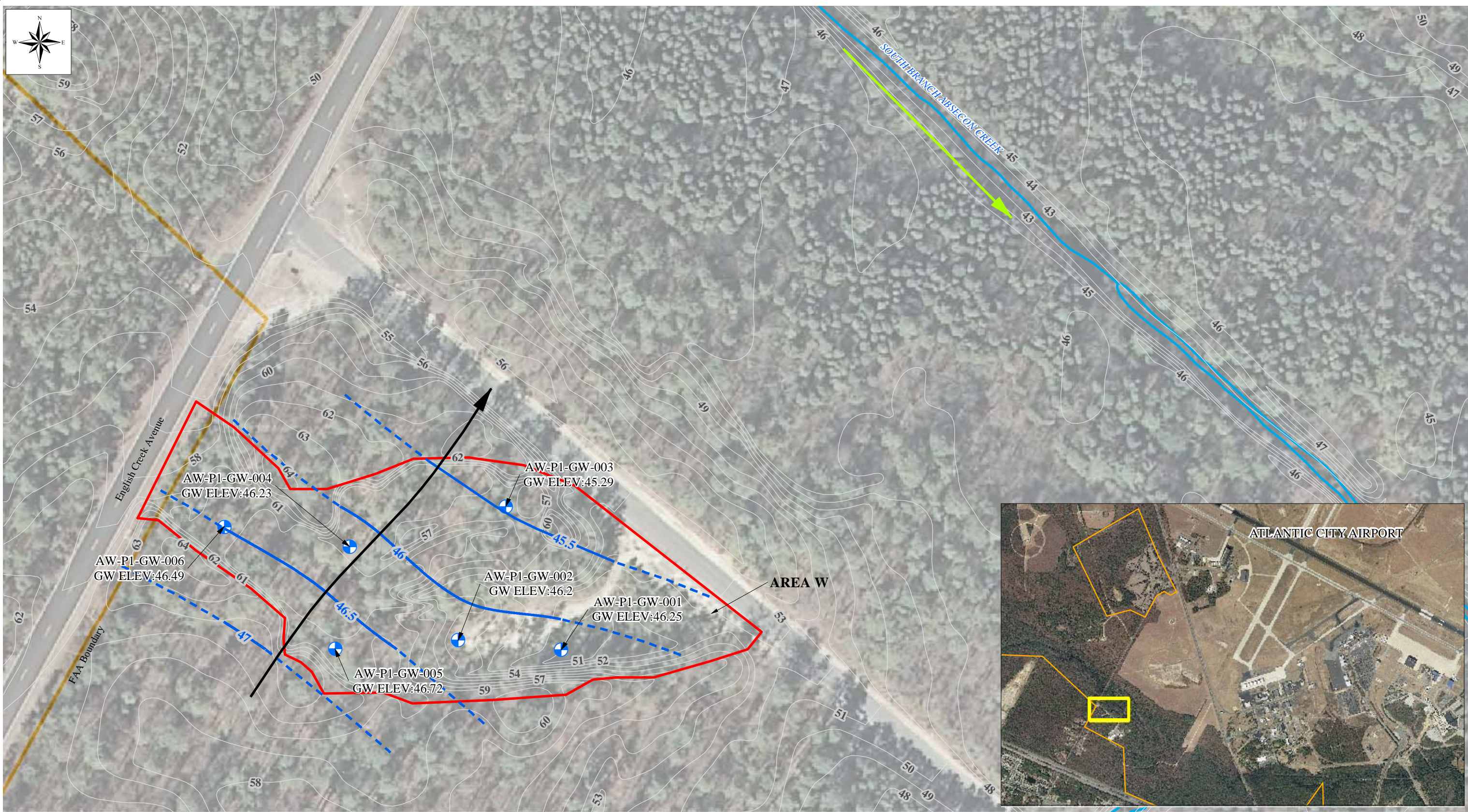
- EPA Residential Well Locations
- Area W
- FAA Property Line Boundary
- South Branch Absecon Creek (Current)
- South Branch Absecon Creek (Original)

Note: Sampled by EPA in 2006.  
Data provided by FAA on November 17, 2006

SCALE:  0 150 300 600 Feet
PROJECT: AREA W SITE INVESTIGATION
CLIENT NAME: U.S. ARMY CORPS OF ENGINEERS

TITLE: ENGLISH CREEK AVENUE EPA RESIDENTIAL WELL SAMPLE LOCATIONS (EPA, 2006)		
	DATE: 7/3/2012	FIGURE #: 4-1





**Legend**

Temporary Well Location	Water Table Elevation (feet)	South Branch Absecon Creek
Groundwater Flow Direction	Water Table Elevation (feet)	FAA Boundary
Surface Water Flow Direction	Elevation Contours (feet)	Area W

**KEY**

AW-P1-GW-005	←	Sample ID
GW ELEV: 46.7	←	Groundwater Elevation

SCALE:

0 75 150

Graphical Scale in Feet

PROJECT:

AREA W SITE INVESTIGATION

CLIENT NAME:

U.S. ARMY CORPS OF ENGINEERS

TITLE:

GROUNDWATER FLOW DIRECTION

AREA W

ATLANTIC CITY NAVAL AIR STATION

FORMERLY USED DEFENSE SITE

EGG HARBOR TOWNSHIP, NEW JERSEY

DATE:

7/3/2012

FIGURE #:

4-2

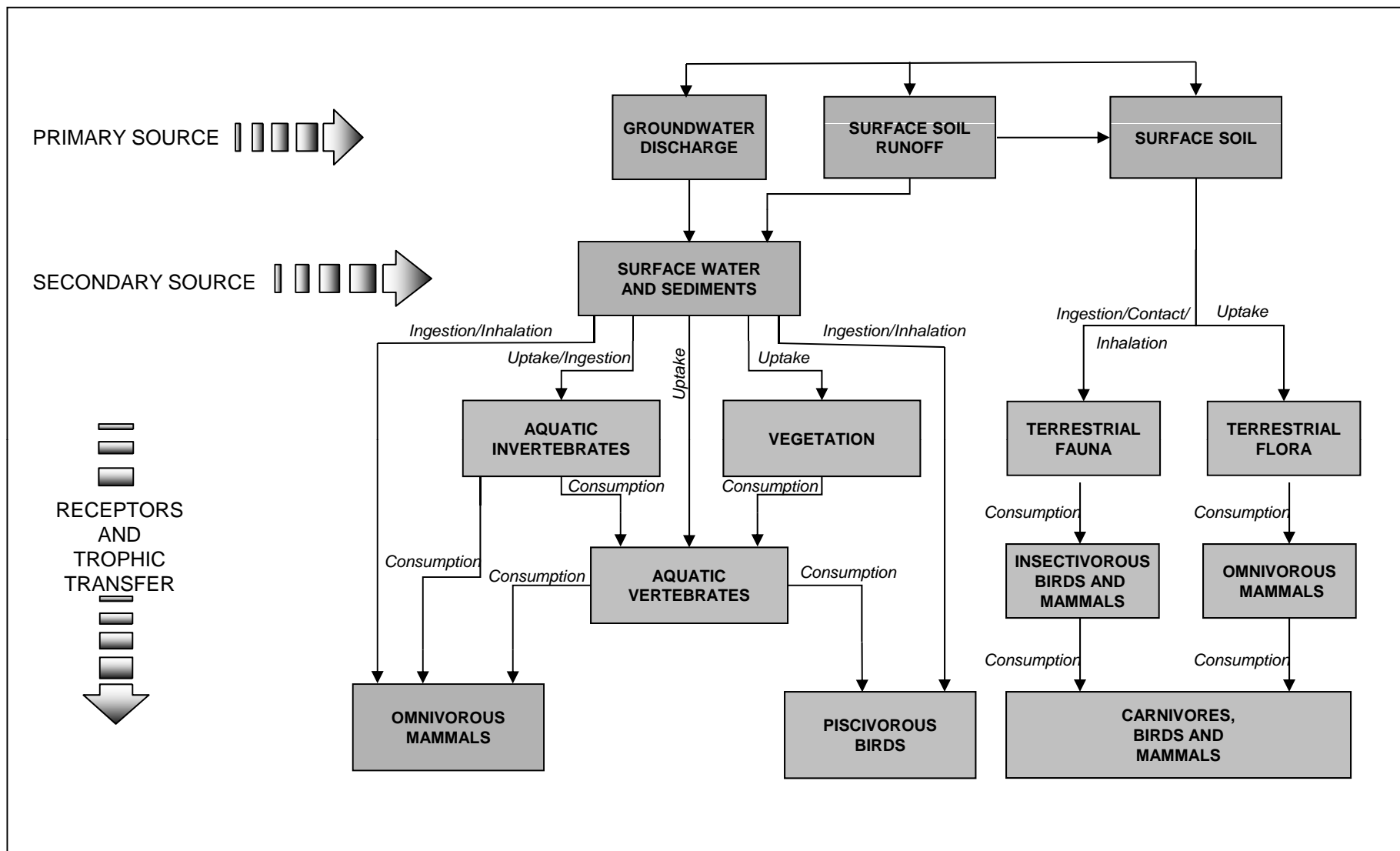
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# LEGEND



Potential Pathways for Evaluation

**FIGURE 5-1**  
**POTENTIAL ECOLOGICAL EXPOSURE PATHWAYS**

*Area W Site Investigation*  
*Atlantic City Naval Air Station FUDS*  
*Egg Harbor Township, New Jersey*

**TABLE 2-1**  
**ANALYTICAL METHODS**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Analysis	Media			
	Soil	Groundwater	Surface Water	Sediment
TCL VOC	5035/8260B	5030B/8260B	5030B/8260B	5035/8260B
TCL SVOC/SIM	3540C/8270C	3520C/8270C	3520C/8270C	3540C/8270C
Pesticides	3541/8081	3510C/8081	3510C/8081	3541/8081
PCB	3541/8082	3510C/8082	3510C/8082	3541/8082
TAL Metals	3050B/6010B/6020/7470A	3010A/6020/7470A	3010A/6020/7470A	3050B/6010B/6020/7470A
Cyanide	SW-846 9012	SW-846 9012	SW-846 9012	SW-846 9012
Total Mercury	7471A/1631 Modified	7470A/1631	7470A/1631	7471A/1631 Modified
Methylmercury	--	1630	1630	1630
Hardness	--	2340C	2340C	--
Grain Size	--	--	--	ASTM D-22
Total Solids	ASTM D2216-92	--	--	ASTM D2216-92
TOC	Lloyd Kahn-9060	--	--	Lloyd Kahn-9060

**NOTES:**

TAL = target analyte list

TOC = total organic carbon

TCL = Total Contaminant List

VOC = volatile organic compound

SVOC = semivolatile organic compounds

PCB = polychlorinated biphenyls

-- = Not analyzed

**TABLE 2-2**  
**SOIL SAMPLE SUMMARY TABLE**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Location	Sample ID	Date	VOC	SVOC/ SIM	Pesticides/ PCB	Metals/ Hardness	Total Hg	% Solids	TOC
AW-P1-SS-001	AW-P1-SS-001-01-01-1	3/1/2011	X	X	X	X	X	X	X
	AW-P1-SS-001-01-01-2		X	X	X	X	X	X	X
	AW-P1-SS-001-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-002	AW-P1-SS-002-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-002-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-003	AW-P1-SS-003-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-003-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-004	AW-P1-SS-004-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-004-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-005	AW-P1-SS-005-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-005-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-006	AW-P1-SS-006-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-006-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-007	AW-P1-SS-007-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-007-01-02-1		X	X	X	X	X	X	X
AW-P1-SS-008	AW-P1-SS-008-01-01-1		X	X	X	X	X	X	X
	AW-P1-SS-008-01-02-1		X	X	X	X	X	X	X

Notes:

Hg - Mercury

SVOC - Semi-volatile organic compound

SIM - Selective ion monitoring

PCB - Polychlorinated biphenyls

VOC - Volatile organic compound

TOC - Total organic carbon

**TABLE 2-3**  
**GROUNDWATER SAMPLE SUMMARY TABLE**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Location ID	Sample ID	Date	VOC	SVOC (SIM)	Pesticides/ PCB	Metals/ Hardness	Total Hg	Methyl Mercury	Cyanide
AW-P1-GW-001	AW-P1-GW-001-01-AA-1	3/2/2011	X	X	X	X	X	X	X
	AW-P1-GW-001-01-AA-1-F		-	X	X	X	X	X	X
AW-P1-GW-002	AW-P1-GW-002-01-AA-1	3/7/2011	-	X	-	X	-	-	-
	AW-P1-GW-002-01-AA-1	3/9/2011	X	-	X	-	X	X	X
AW-P1-GW-003	AW-P1-GW-003-01-AA-1	3/3/2011	X	X	X	X	X	X	X
AW-P1-GW-004	AW-P1-GW-004-01-AA-1	3/3/2011	X	-	-	X	-	-	X
	AW-P1-GW-004-01-AA-1	3/7/2011	-	X	X	-	X	X	-
AW-P1-GW-005	AW-P1-GW-005-01-AA-1	3/3/2011	X	X	X	X	X	X	X
AW-P1-GW-006	AW-P1-GW-006-01-AA-1	3/7/2011	-	-	X	X	-	-	-
	AW-P1-GW-006-01-AA-1	3/9/2011	X	X	-	-	X	X	X
AW-P1-GW-007	AW-P1-GW-007-01-AA-1	3/4/2011	-	-	-	-	X	X	-
	AW-P1-GW-007-01-AA-1-F		-	-	-	-	X	X	-
	AW-P1-GW-007-01-AA-2		-	-	-	-	X	X	-
	AW-P1-GW-007-01-AA-1	3/7/2011	X	X	X	X	-	-	X
	AW-P1-GW-007-01-AA-2		X	X	X	X	-	-	X
	AW-P1-GW-007-01-AA-1-F		-	X	X	X	-	-	X
AW-P1-GW-008	AW-P1-GW-008-01-AA-1	3/4/2011	X	X	X	X	-	-	X
	AW-P1-GW-008-01-AA-1-F		-	X	X	X	-	-	X
	AW-P1-GW-008-01-AA-1	3/7/2011	-	-	-	-	X	X	-
	AW-P1-GW-008-01-AA-1-F		-	-	-	-	X	X	-

Notes:

Hg - Mercury

SVOC - Semi-volatile organic compound

SIM - Selective ionic monitoring

PCB - Polychlorinated biphenyls

VOC - Volatile organic compound

F - Filtered

- Not analyzed

**TABLE 2-4**  
**DEPTH TO GROUNDWATER AT TEMPORARY WELL POINTS**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Sample Location	Date	DTW (ft)	TD(ft)
AW-P1-GW-001	2-Mar-11	4.75	9.25
AW-P1-GW-002	3-Mar-11	8.8	11.62
AW-P1-GW-003	3-Mar-11	11.71	17.84
AW-P1-GW-004	3-Mar-11	12.77	14.76
AW-P1-GW-005	3-Mar-11	12.28	14.82
AW-P1-GW-006	3-Mar-11	13.51	14.83
AW-P1-GW-007	4-Mar-11	8.22	13.49
AW-P1-GW-008	4-Mar-11	6.61	10.98

**NOTES:**

DTW - Depth to water

TD - Total depth

**TABLE 2-5**  
**GROUNDWATER QUALITY PARAMETERS**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Temporary Well	Sampling Event	Date	Initial (I) Post-Purge (P) Filtered (F)	Color	pH	Temperature (°C)	Dissolved Oxygen		ORP	Conductivity (ms/cm <sup>3</sup> )	Turbidity (NTU)	
							%	mg/L			YSI 6920	LaMotte 2020
GW-001	01	3/2/2011	I	Yellow Milky	8.06	9.07	113.6	13.24	37.1	0.023	1666.9	3695.0
	02	3/2/2011	P	Clear	6.92	8.39	110.5	12.94	105.1	0.014	7.30	4.54
	03	3/2/2011	F	Clear	6.33	8.33	114.1	13.38	174.1	0.015	1.80	3.04
GW-003	01	3/2/2011	I	Yellow Tan	7.86	3.85	116.1	15.11	2.5	0.069	423.5	NA
	02	3/2/2011	P	NA	6.76	9.59	100.2	11.41	112.6	0.063	11.8	11.6
GW-004	01	3/2/2011	I	NA	NA	NA	NA	NA	NA	NA	NA	101.4
GW-005	01	3/2/2011	I	NA	NA	NA	NA	NA	NA	NA	NA	89.0
GW-007	01	3/2/2011	I	Orange Milky	4.84	8.55	102.2	11.79	164.3	0.041	997.6	1633.0
	02	3/2/2011	P	Cloudy	5.04	8.89	103.2	11.81	181.7	0.025	5.4	2.09
	03	3/2/2011	F	Clear	4.86	8.95	98.9	11.42	184.8	0.041	0.1	0.08
GW-008	01	3/2/2011	I	Yellow Milky	6.75	7.15	74.6	9.11	31.8	0.044	630.7	493.0
	02	3/2/2011	P	Clear Cloudy	5.82	8.17	89.6	10.61	92.3	0.032	36.8	7.81

Notes:

mg/L - milligrams per liter

ORP - Oxidation reduction potential

NA - Not Analyzed

**TABLE 2-6**  
**SURFACE WATER SAMPLE SUMMARY TABLE**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Location	Sample ID	Date	VOC	SVOC/ SIM	Pesticides/ PCB	Metals/ Hardness	Total Hg	Methyl Mercury	Cyanide
AW-P1-SW-001	AW-P1-SW-001-01-01-1	3/3/2011	X	X	X	X	X	X	X
	AW-P1-SW-001-01-01-1-F		X	X	X	X	X	X	X
AW-P1-SW-002	AW-P1-SW-002-01-01-1	3/1/2011	X	X	X	X	X	X	X
	AW-P1-SW-002-01-01-1-F		X	X	X	X	X	X	X
AW-P1-SW-003	AW-P1-SW-003-01-01-1	3/3/2011	X	X	X	X	X	X	X
	AW-P1-SW-003-01-01-1-F		X	X	X	X	X	X	X
AW-P1-SW-004	AW-P1-SW-004-01-01-1	3/4/2011	X	X	X	X	X	X	X
	AW-P1-SW-004-01-01-1-F		X	X	X	X	X	X	X
	AW-P1-SW-004-01-01-2		X	X	X	X	X	X	X
AW-P1-SW-005	AW-P1-SW-005-01-01-1	3/4/2011	X	X	X	X	X	X	X
	AW-P1-SW-005-01-01-1-F		X	X	X	X	X	X	X
AW-P1-SW-006	AW-P1-SW-006-01-01-1	3/2/2011	X	X	X	X	X	X	X
	AW-P1-SW-006-01-01-1-F		X	X	X	X	X	X	X

Notes:

Hg - Mercury

SVOC - Semi-volatile organic compound

SIM - Selective ionic monitoring

PCB - Polychlorinated biphenyls

VOC - Volatile organic compound

F - Filtered

**TABLE 2-7**  
**SURFACE WATER QUALITY PARAMETERS**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Location	Sampling Event	Date	Intial (I) Post-Purge (P) Filtered (F)	pH	Temperature (°C)	Dissolved Oxygen		ORP	Conductivity (ms/cm <sup>3</sup> )	Turbidity (NTU)
						%	mg/L			YSI 6920
SW-001	01	3/3/2011	I	4.91	7.22	100.7	12.43	216.3	0.072	0.5
	02	3/3/2011	F	NA	NA	NA	NA	NA	NA	NA
SW-002	01	3/1/2011	I	5.66	13.23	64.9	6.67	159.7	0.103	0.6
	02	3/1/2011	F	NA	NA	NA	NA	NA	NA	NA
SW-003	01	3/3/2011	I	4.08	5.12	104.4	13.12	229.9	0.068	16.8
	02	3/3/2011	F	NA	NA	NA	NA	NA	NA	NA
SW-004	01	3/4/2011	I	4.5	7.86	87.9	10.16	238.7	0.064	2.6
	02	3/4/2011	F	NA	NA	NA	NA	NA	NA	NA
	03	3/4/2011	I	NA	NA	NA	NA	NA	NA	NA
SW-005	01	3/4/2011	I	4.89	1.20	91.7	12.47	138.2	0.045	6.5
	02	3/4/2011	F	NA	NA	NA	NA	NA	NA	NA
SW-008	01	3/2/2011	I	6.77	3.32	69.8	7.60	129.2	0.075	33.4
	02	3/2/2011	F	NA	NA	NA	NA	NA	NA	NA

Notes:

mg/L - milligrams per liter

ORP - Oxidation reduction potential

NA - Not analyzed

NTU - nephelometric turbidity unit



**TABLE 2-8**  
**SEDIMENT SAMPLE SUMMARY TABLE**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Location	Sample ID	Date	VOC	SVOC/ SIM	Pesticides/ PCB	Metals	Total Hg	MeHg	Cyanide	% Moisture	Grain Size	TOC
AW-P1-SD-001	AW-P1-SD-001-01-01-1	3/3/2011	X	X	X	X	X	X	X	X	X	X
AW-P1-SD-002	AW-P1-SD-002-01-01-1	3/1/2011	X	X	X	X	X	X	X	X	X	X
AW-P1-SD-003	AW-P1-SD-003-01-01-1	3/3/2011	X	X	X	X	X	X	X	X	X	X
AW-P1-SD-004	AW-P1-SD-004-01-01-1	3/4/2011	X	X	X	X	X	X	X	X	X	X
	AW-P1-SD-004-01-01-2	3/4/2011	X	X	X	X	X	X	X	X	X	X
AW-P1-SD-005	AW-P1-SD-005-01-01-1	3/4/2011	X	X	X	X	X	X	X	X	X	X
AW-P1-SD-006	AW-P1-SD-006-01-01-1	3/2/2011	X	X	X	X	X	X	X	X	X	X

Notes:

Hg - Mercury

MeHg - Methyl Mercury

SVOC - Semi-volatile organic compound

SIM - Selective ionic monitoring

PCB - Polychlorinated biphenyls

VOC - Volatile organic compound

TOC - Total organic carbon

2 - Duplicate

- Not analyzed

**TABLE 2-9**  
**DEVIATIONS FROM THE COMBINED WORKPLAN AND SAMPLING AND ANALYSIS PLAN**  
**AND NJDEP-APPROVED METHODOLOGY**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Deviation No.	Applicable Section of SIR	Applicable Section of Work Plan	Description of Deviation from Workplan	Rationale/Justification for Deviation from EPA-Approved Work Plan
1	2.2.1	N/A	*Soil samples were homogenized in disposable aluminum pans with disposable polyethylene trowels.	Use of these materials could have potential to result in elevated aluminum and/or SVOC compounds. Equipment blank samples were collected from the sampling equipment each day. The analytical results from the equipment blank samples did not detect any compounds. While aluminum and some SVOCs were detected in soil samples, the concentrations were within documented regional background concentrations as discussed in Section 4.2.1.
2	2.2.3	4.4	All eight well point locations remained in place for more than 48 continuous hours due to poor recharge rates in GW-002, GW-004, GW-006.	The NJDEP was contacted and a request was made for an extension to the 48-hour maximum allowable open well point requirement. An approval via email from NJDEP case manager was received on March 3, 2011.
3	2.3.2	4.4	The three-volume purge method was unattainable at locations:  <ul style="list-style-type: none"> <li>•GW-002,</li> <li>•GW-005,</li> <li>•GW-004,</li> <li>•GW-006,</li> </ul> These temporary wells were purged dry, allowed to recharge and purged again. The amount of purging rounds ranged from 15 to 30 times per well point.	Less than three well volumes was purged because of the very low hydraulic conductivity of the formation at these locations. The rounds of purge and recharge were continued until the turbidity measured less than 20 NTU. Turbidity was used as a metric to indicate the completion of purging.
4	2.3.2	4.4	Filtered groundwater samples were not collected for analysis for locations GW-002, GW-003, GW-004, GW-005, GW-006.	Temporary wells were not producing the volume of groundwater needed to collect both non-filtered and filtered samples because of the very low hydraulic conductivity of the formation.
5	2.3.2	4.4	The collection of WQIP (pH, conductivity, turbidity, temperature, DO and ORP), was not performed continuously during development and sample collection.	Due to the groundwater recharge limitations caused by the low hydraulic conductivity, sample volume for the required analyses was the priority for GW-002, GW-004, GW-006. The LaMotte 2020 uses 20 ml to measure turbidity therefore, only turbidity was measured prior to sample collection.
6	2.3.4	4.2	Sediment samples were collected via hand auger with a 4-inch diameter sediment bucket auger rather than a PVC driver with an attached 3-inch-diameter polycarbonate sampling sleeve.	The PVC driver did not get sufficient sample recovery. The bucket auger retrieved the volume needed and was more manageable to use at these limited access locations.

**NOTES:**

WQIP - Water Quality Indicator Parameters

DO - Dissolved Oxygen

ORP - Oxidation Reduction Potential

SIR - Site Investigation Report

\*Deviation from NJDEP Field Sampling Procedures Manual (NJDEP, 2005)

Table 2-10  
SUMMARY OF SOIL SCREENING CRITERIA  
Area W Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP <sup>1</sup>			USEPA <sup>2</sup>	
	Residential SRS	Non-Residential SRS	Impact to Groundwater	RSL Resident	RSL Industrial
<b>Volatile Organic Compounds (VOC)</b>					
1,1,1-TRICHLOROETHANE	290	4200	0.2	8700	38000
1,1,2,2-TETRACHLOROETHANE	1	3	0.005	0.56	2.8
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	NLE	43000	180000
1,1,2-TRICHLOROETHANE	2	6	0.01	1.1	5.3
1,1-DICHLOROETHANE	8	24	0.2	3.3	17
1,1-DICHLOROETHENE	11	150	0.005	240	1100
1,2,3-TRICHLOROBENZENE	NLE	NLE	NLE	49	490
1,2,4-TRICHLOROBENZENE	73	820	0.4	22	99
1,2-DIBROMO-3-CHLOROPROPANE	0.08	0.2	0.005	0.0054	0.069
1,2-DICHLOROBENZENE	5300	59000	11	1900	9800
1,2-DICHLOROETHANE	0.9	3	0.005	0.43	2.2
1,2-DICHLOROPROPANE	2	5	0.005	0.94	4.7
1,3-DICHLOROBENZENE	5300	59000	12	NLE	NLE
1,4-DICHLOROBENZENE	5	13	1	2.4	12
1,4-DIOXANE	NLE	NLE	NLE	4.9	17
2-BUTANONE	3100	44000	0.6	28000	200000
2-HEXANONE	NLE	NLE	NLE	210	1400
4-METHYL-2-PENTANONE	NLE	NLE	NLE	5300	53000
ACETONE	70000	NLE	12	61000	630000
BENZENE	2	5	0.005	1.1	5.4
BROMODICHLOROMETHANE	1	3	0.005	0.27	1.4
BROMOFORM	81	280	0.02	62	220
BROMOMETHANE	25	59	0.03	7.3	32
CARBON DISULFIDE	7800	110000	4	820	3700
CARBON TETRACHLORIDE	0.6	2	0.005	0.61	3
CHLOROBENZENE	510	7400	0.4	290	1400
CHLOROBROMOMETHANE	NLE	NLE	NLE	160	680
CHLOROETHANE	220	1100	NLE	15000	61000
CHLOROFORM	0.6	2	0.2	0.29	1.5
CHLOROMETHANE	4	12	NLE	120	500
CIS-1,2-DICHLOROETHENE	230	560	0.2	160	2000
CIS-1,3-DICHLOROPROPENE	2(D)	7(D)	NLE	1.7(D)	8.5(D)
CYCLOHEXANE	NLE	NLE	NLE	7000	29000
DIBROMOCHLOROMETHANE	3	8	0.005	0.68	3.3
DICHLORODIFLUOROMETHANE	490	230000	25	94	400
ETHYLBENZENE	7800	110000	8	5.4	27
ETHYLENE DIBROMIDE	0.008	0.04	0.005	0.034	0.17
ISOPROPYLBENZENE	NLE	NLE	NLE	2100	11000
M,P-XYLENES	NLE	NLE	NLE	NLE	NLE
METHYL ACETATE	78000	NLE	14	78000	1000000
METHYLCYCLOHEXANE	NLE	NLE	NLE	NLE	NLE
METHYLENE CHLORIDE	34	97	0.007	11	53
METHYL-T-BUTYL ETHER (MTBE)	110	320	0.2	43	220
O-XYLENE	NLE	NLE	NLE	690	3000
STYRENE	90	260	2	6300	36000
TETRACHLOROETHYLENE	2	5	0.005	0.55	2.6
TOLUENE	6300	91000	4	5000	45000
TRANS-1,2-DICHLOROETHENE	300	720	0.4	150	690
TRANS-1,3-DICHLOROPROPENE	2(D)	7(D)	NLE	1.7(D)	8.5(D)
TRICHLOROETHYLENE (TCE)	7	20	0.007	0.91	6.4
TRICHLOROFLUOROMETHANE	23000	340000	22	790	3400
VINYL CHLORIDE	0.7	2	0.005	0.06	1.7
XYLENES (TOTAL)	12000	170000	12	630	2700
<b>Semivolatile Organic Compounds (SVOC)</b>					
1,2,4,5-TETRACHLOROBENZENE	NLE	NLE	NLE	18	180
2,3,4,6-TETRACHLOROPHENOL	NLE	NLE	NLE	1800	18000
2,4,5-TRICHLOROPHENOL	6100	68000	44	6100	62000
2,4,6-TRICHLOROPHENOL	19	74	0.2	44	160
2,4-DICHLOROPHENOL	180	2100	0.2	180	1800
2,4-DIMETHYLPHENOL	1200	14000	0.7	1200	12000
2,4-DINITROPHENOL	120	1400	0.3	120	1200
2,4-DINITROTOLUENE	0.7	3	0.7	1.6	5.5
2,6-DINITROTOLUENE	0.7	3	0.7	61	620
2-CHLORONAPHTHALENE	NLE	NLE	NLE	6300	82000
2-CHLOROPHENOL	310	2200	0.5	390	5100
2-METHYLNAPHTHALENE	230	2400	5	310	4100
2-METHYLPHENOL (O-CRESOL)	310	3400	NLE	3100	31000
2-NITROANILINE	39	23000	NLE	610	6000
2-NITROPHENOL	NLE	NLE	NLE	NLE	NLE
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	31	310(A)	3100(A)
3,3-DICHLOROBENZIDINE	1	4	0.2	1.1	3.8
3-NITROANILINE	NLE	NLE	NLE	NLE	NLE

Table 2-10  
SUMMARY OF SOIL SCREENING CRITERIA  
Area W Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP <sup>1</sup>			USEPA <sup>2</sup>	
	Residential SRS	Non- Residential SRS	Impact to Groundwater	RSL Resident	RSL Industrial
4,6-DINITRO-2-METHYLPHENOL	6	68	0.3	4.9	49
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	NLE	NLE	NLE	6100	62000
4-CHLOROANILINE	NLE	NLE	NLE	2.4	8.6
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	NLE	24	86
4-NITROPHENOL	NLE	NLE	NLE	NLE	NLE
ACENAPHTHENE	3400	37000	74	3400	33000
ACENAPHTHYLENE	NLE	300000	NLE	NLE	NLE
ACETOPHENONE	2	5	2	7800	100000
ANTHRACENE	17000	30000	1500	17000	170000
ATRAZINE	210	2400	0.2	2.1	7.5
BENZALDEHYDE	6100	68000	6100	7800	100000
BENZO(A)ANTHRACENE	0.6	2	0.5	0.15	2.1
BENZO(A)PYRENE	0.2	0.2	0.2	0.015	0.21
BENZO(B)FLUORANTHENE	0.6	2	NLE	0.15	2.1
BENZO(G,H,I)PERYLENE	380000	30000	NLE	NLE	NLE
BENZO(K)FLUORANTHENE	6	23	16	1.5	21
BIPHENYL	3100	34000	90	51	210
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	NLE	180	1800
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	0.4	2	0.2	0.21	1
BIS(2-CHLOROISOPROPYL)ETHER	23	67	3	4.6	22
BIS(2-ETHYLHEXYL) PHTHALATE	35	140	790	35	120
BUTYLBENZYLPHthalate	1200	14000	150	260	910
CAPROLACTAM	NLE	NLE	8	31000	310000
CARBAZOLE	24	96	NLE	NLE	NLE
CHRYSENE	62	230	52	15	210
DIBENZ(A,H)ANTHRACENE	0.2	0.2	NLE	0.015	0.21
DIBENZOFURAN	NLE	NLE	NLE	78	1000
DIETHYL PHTHALATE	49000	550000	57	49000	490000
DIMETHYL PHTHALATE	NLE	NLE	NLE	NLE	NLE
DI-N-BUTYL PHTHALATE	6100	68000	620	6100	62000
DI-N-OCTYL PHTHALATE	2400	27000	NLE	NLE	NLE
FLUORANTHENE	2300	24000	840	2300	22000
FLUORENE	2300	24000	110	2300	22000
HEXACHLORO BENZENE	0.3	1	0.2	0.3	1.1
HEXACHLOROBUTADIENE	6	25	0.6	6.2	22
HEXACHLOROCYCLOPENTADIENE	45	110	NLE	370	3700
HEXACHLOROETHANE	35	140	0.2	12	43
INDENO(1,2,3-CD)PYRENE	0.6	2	5	0.15	2.1
ISOPHORONE	510	2000	0.2	510	1800
NAPHTHALENE	6	17	16	3.6	18
NITROBENZENE	31	340	0.2	4.8	24
N-NITROSO-DI-N-PROPYLAMINE	0.2	0.3	0.2	0.069	0.25
N-NITROSODIPHENYLAMINE	99	390	0.2	99	350
PENTACHLOROPHENOL	3	10	0.3	0.89	2.7
PHENANTHRENE	NLE	300000	NLE	NLE	NLE
PHENOL	18000	210000	5	18000	180000
PYRENE	1700	18000	550	1700	17000
<b>Polychlorinated Biphenyls (PCB)</b>					
AROCLOR-1016	0.2	1	NLE	3.9	21
AROCLOR-1221	0.2	1	NLE	0.14	0.54
AROCLOR-1232	0.2	1	NLE	0.14	0.54
AROCLOR-1242	0.2	1	NLE	0.22	0.74
AROCLOR-1248	0.2	1	NLE	0.22	0.74
AROCLOR-1254	0.2	1	NLE	0.22	0.74
AROCLOR-1260	0.2	1	NLE	0.22	0.74
AROCLOR-1262	0.2	1	NLE	NLE	NLE
AROCLOR-1268	NLE	NLE	NLE	NLE	NLE
<b>Pesticides</b>					
4,4-DDD	3	13	3	2	7.2
4,4-DDE	2	9	12	1.4	5.1
4,4-DDT	2	8	7	1.7	7
ALDRIN	0.04	0.2	0.1	0.029	0.1
ALPHA-BHC	0.1	0.5	0.002	0.077	0.27
ALPHA-CHLORDANE	NLE	NLE	0.03	NLE	NLE
BETA-BHC	0.4	2	0.002	0.27	0.96
DELTA-BHC	NLE	NLE	NLE	NLE	NLE
DIELDRIN	0.04	0.2	0.003	0.03	0.11
ENDOSULFAN I	470	6800	2	NLE	NLE
ENDOSULFAN II	470	6800	2	NLE	NLE
ENDOSULFAN SULFATE	470	6800	1	NLE	NLE

Table 2-10  
SUMMARY OF SOIL SCREENING CRITERIA  
Area W Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP <sup>1</sup>			USEPA <sup>2</sup>	
	Residential SRS	Non-Residential SRS	Impact to Groundwater	RSL Resident	RSL Industrial
ENDRIN	23	340	0.6	18	180
ENDRIN ALDEHYDE	NLE	NLE	NLE	NLE	NLE
ENDRIN KETONE	NLE	NLE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.4	2	0.002	0.52	2.1
HEPTACHLOR	0.1	0.7	0.3	0.11	0.38
HEPTACHLOR EPOXIDE	0.07	0.3	0.009	0.053	0.19
METHOXYCHLOR	390	5700	100	310	3100
TOXAPHENE	0.6	3	0.2	0.44	1.6
TRANS-CHLORDANE	NLE	NLE	NLE	NLE	NLE
<b>Metals</b>					
ALUMINUM	78000	NLE	3900	77000	990000
ANTIMONY	31	450	6	31	410
ARSENIC	19	19	19	0.39	1.6
BARIUM	16000	59000	1300	15000	190000
BERYLLIUM	16	140	0.5	160	2000
CADMIUM	78	78	1	70	800
CALCIUM	NLE	NLE	NLE	NLE	NLE
CHROMIUM	240	20	NLE	0.29	5.60
COBALT	1600	590	59	23	300
COPPER	3100	45000	7300	3100	41000
IRON	NLE	820	NLE	55000	720000
LEAD	400	800	59	400	800
MAGNESIUM	NLE	NLE	NLE	NLE	NLE
MANGANESE	11000	5900	42	1800	23000
MERCURY	23	65	0.1	10	43
METHYL MERCURY	NLE	NLE	NLE	NLE	NLE
NICKEL	1600	23000	31	1500	20000
POTASSIUM	NLE	NLE	NLE	NLE	NLE
SELENIUM	390	5700	7	390	5100
SILVER	390	5700	1	390	5100
SODIUM	NLE	NLE	NLE	NLE	NLE
THALLIUM	5	79	3	0.78	10
VANADIUM	78	1100	NLE	NLE	NLE
ZINC	23000	110000	600	23000	310000
<b>Inorganics</b>					
CYANIDE, TOTAL	1600	23000	13	1600	20000
<b>Others</b>					
SOLIDS, TOTAL	NLE	NLE	NLE	NLE	NLE
TOTAL ORGANIC CARBON	NLE	NLE	NLE	NLE	NLE
% MOISTURE	NLE	NLE	NLE	NLE	NLE

Notes:

All results are in mg/kg unless otherwise noted.

1. NJDEP Soil Remediation Standards, September 2, 2009 Update
2. USEPA Regional Screening Levels, May 2012 Update

(A) - Values are for P-Cresol

(B) - Values for total PCBs

(C) - Values for total DDT

(D) - Values for Total 1,3-DICHLOROPROPENE

NLE - No Limits Established

mg/kg - miligram / kilogram

NJDEP - New Jersey Department of Environmental Protection

SRS - Site Remediation Standards

USEPA - United States Environmental Protection Agency

RSL - Regional Screening Levels

Strictest criteria are shaded

Table 2-11  
SUMMARY OF SOIL SCREENING CRITERIA - ECOLOGICAL  
Area W Site Investigation Report  
ACNAS FUDS, Egg Harbor Township

Parameter	NJDEP <sup>1</sup>		USEPA <sup>2</sup> /NJDEP			
	Wildlife PRGs	Terrestrial Plant Tox Benchmarks	EcoSSLs - Plants	EcoSSLs - Mammalian	EcoSSLs – Soil Invertebrates	EcoSSLs - Avian
<b><i>Volatile Organic Compounds (VOC)</i></b>						
1,1,1-TRICHLOROETHANE	29.8	NLE	NLE	NLE	NLE	NLE
1,1,2,2-TETRACHLOROETHANE	0.127	NLE	NLE	NLE	NLE	NLE
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	NLE	NLE	NLE	NLE
1,1,2-TRICHLOROETHANE	28.6	NLE	NLE	NLE	NLE	NLE
1,1-DICHLOROETHANE	NLE	NLE	NLE	NLE	NLE	NLE
1,1-DICHLOROETHENE	8.28	NLE	NLE	NLE	NLE	NLE
1,2,3-TRICHLOROBENZENE	20	NLE	NLE	NLE	NLE	NLE
1,2,4-TRICHLOROBENZENE	20	NLE	NLE	NLE	NLE	NLE
1,2-DIBROMO-3-CHLOROPROPANE	NLE	NLE	NLE	NLE	NLE	NLE
1,2-DICHLOROBENZENE	2.96	NLE	NLE	NLE	NLE	NLE
1,2-DICHLOROETHANE	21.2	NLE	NLE	NLE	NLE	NLE
1,2-DICHLOROPROPANE	32.7	NLE	NLE	NLE	NLE	NLE
1,3-DICHLOROBENZENE	37.7	NLE	NLE	NLE	NLE	NLE
1,4-DICHLOROBENZENE	0.546	NLE	NLE	NLE	NLE	NLE
1,4-DIOXANE	NLE	NLE	NLE	NLE	NLE	NLE
2-BUTANONE	NLE	NLE	NLE	NLE	NLE	NLE
2-HEXANONE	NLE	NLE	NLE	NLE	NLE	NLE
4-METHYL-2-PENTANONE	NLE	NLE	NLE	NLE	NLE	NLE
ACETONE	NLE	NLE	NLE	NLE	NLE	NLE
BENZENE	0.255	NLE	NLE	NLE	NLE	NLE
BROMODICHLOROMETHANE	0.54	NLE	NLE	NLE	NLE	NLE
BROMOFORM	15.9	NLE	NLE	NLE	NLE	NLE
BROMOMETHANE	0.235	NLE	NLE	NLE	NLE	NLE
CARBON DISULFIDE	NLE	NLE	NLE	NLE	NLE	NLE
CARBON TETRACHLORIDE	2.98	NLE	NLE	NLE	NLE	NLE
CHLOROBENZENE	13.1	NLE	NLE	NLE	NLE	NLE
CHLOROBROMOMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
CHLOROETHANE	NLE	NLE	NLE	NLE	NLE	NLE
CHLOROFORM	1.19	NLE	NLE	NLE	NLE	NLE
CHLOROMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
CIS-1,2-DICHLOROETHENE	NLE	NLE	NLE	NLE	NLE	NLE
CIS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE	NLE	NLE
CYCLOHEXANE	NLE	NLE	NLE	NLE	NLE	NLE
DIBROMOCHLOROMETHANE	2.05	NLE	NLE	NLE	NLE	NLE
DICHLORODIFLUOROMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
ETHYLBENZENE	5.16	NLE	NLE	NLE	NLE	NLE
ETHYLENE DIBROMIDE	NLE	NLE	NLE	NLE	NLE	NLE
ISOPROPYLBENZENE	NLE	NLE	NLE	NLE	NLE	NLE
M,P-XYLENES	NLE	NLE	NLE	NLE	NLE	NLE
METHYL ACETATE	NLE	NLE	NLE	NLE	NLE	NLE
METHYLCYCLOHEXANE	NLE	NLE	NLE	NLE	NLE	NLE
METHYLENE CHLORIDE	4.05	NLE	NLE	NLE	NLE	NLE
METHYL-T-BUTYL ETHER (MTBE)	NLE	NLE	NLE	NLE	NLE	NLE
O-XYLENE	NLE	NLE	NLE	NLE	NLE	NLE
STYRENE	4.69	300	NLE	NLE	NLE	NLE
TETRACHLOROETHYLENE	9.92	NLE	NLE	NLE	NLE	NLE
TOLUENE	200	200	NLE	NLE	NLE	NLE
TRANS-1,2-DICHLOROETHENE	0.784	NLE	NLE	NLE	NLE	NLE
TRANS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE	NLE	NLE
TRICHLOROETHYLENE (TCE)	12.4	NLE	NLE	NLE	NLE	NLE
TRICHLOROFLUOROMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
VINYL CHLORIDE	0.646	NLE	NLE	NLE	NLE	NLE
XYLENES (TOTAL)	10	NLE	NLE	NLE	NLE	NLE
<b><i>Semivolatile Organic Compounds (SVOC)</i></b>						
1,2,4,5-TETRACHLOROBENZENE	2.02	NLE	NLE	NLE	NLE	NLE
2,3,4,6-TETRACHLOROPHENOL	NLE	NLE	NLE	NLE	NLE	NLE
2,4,5-TRICHLOROPHENOL	9	4	NLE	NLE	NLE	NLE
2,4,6-TRICHLOROPHENOL	4	NLE	NLE	NLE	NLE	NLE
2,4-DICHLOROPHENOL	87.5	NLE	NLE	NLE	NLE	NLE
2,4-DIMETHYLPHENOL	0.01	NLE	NLE	NLE	NLE	NLE
2,4-DINITROPHENOL	0.0609	20	NLE	NLE	NLE	NLE
2,4-DINITROTOLUENE	1.28	NLE	NLE	NLE	NLE	NLE
2,6-DINITROTOLUENE	NLE	NLE	NLE	NLE	NLE	NLE
2-CHLORONAPHTHALENE	0.0122	NLE	NLE	NLE	NLE	NLE
2-CHLOROPHENOL	0.243	NLE	NLE	NLE	NLE	NLE
2-METHYLNAPHTHALENE	3.24	NLE	NLE	NLE	NLE	NLE

Table 2-11  
SUMMARY OF SOIL SCREENING CRITERIA - ECOLOGICAL  
Area W Site Investigation Report  
ACNAS FUDS, Egg Harbor Township

Parameter	NJDEP <sup>1</sup>		USEPA <sup>2</sup> /NJDEP			
	Wildlife PRGs	Terrestrial Plant Tox Benchmarks	EcoSSLs - Plants	EcoSSLs - Mammalian	EcoSSLs - Soil Invertebrates	EcoSSLs - Avian
2-METHYLPHENOL (O-CRESOL)	NLE	NLE	NLE	NLE	NLE	NLE
2-NITROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
2-NITROPHENOL	NLE	NLE	NLE	NLE	NLE	NLE
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	NLE	NLE	NLE	NLE
3,3-DICHLORO BENZIDINE	0.646	NLE	NLE	NLE	NLE	NLE
3-NITROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
4,6-DINITRO-2-METHYLPHENOL	NLE	NLE	NLE	NLE	NLE	NLE
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE	NLE
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	NLE	NLE	NLE	NLE	NLE	NLE
4-CHLOROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
4-NITROPHENOL	5.12	NLE	NLE	NLE	NLE	NLE
ACENAPHTHENE	20	NLE	NLE	NLE	NLE	NLE
ACENAPHTHYLENE	682	NLE	NLE	NLE	NLE	NLE
ACETOPHENONE	NLE	NLE	NLE	NLE	NLE	NLE
ANTHRACENE	1480	NLE	NLE	NLE	NLE	NLE
ATRAZINE	NLE	NLE	NLE	NLE	NLE	NLE
BENZALDEHYDE	NLE	NLE	NLE	NLE	NLE	NLE
BENZO(A)ANTHRACENE	5.21	NLE	NLE	NLE	NLE	NLE
BENZO(A)PYRENE	1.52	NLE	NLE	NLE	NLE	NLE
BENZO(B)FLUORANTHENE	59.8	NLE	NLE	NLE	NLE	NLE
BENZO(G,H,I)PERYLENE	119	NLE	NLE	NLE	NLE	NLE
BENZO(K)FLUORANTHENE	148	NLE	NLE	NLE	NLE	NLE
BIPHENYL	60	NLE	NLE	NLE	NLE	NLE
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	NLE	NLE	NLE	NLE
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	23.7	NLE	NLE	NLE	NLE	NLE
BIS(2-CHLOROISOPROPYL)ETHER	19.9	NLE	NLE	NLE	NLE	NLE
BIS(2-ETHYLHEXYL) PHTHALATE	0.925	NLE	NLE	NLE	NLE	NLE
BUTYLBENZYLPHTHALATE	0.239	NLE	NLE	NLE	NLE	NLE
CAPROLACTAM	NLE	NLE	NLE	NLE	NLE	NLE
CARBAZOLE	NLE	NLE	NLE	NLE	NLE	NLE
CHRYSENE	4.73	NLE	NLE	NLE	NLE	NLE
DIBENZ(A,H)ANTHRACENE	18.4	NLE	NLE	NLE	NLE	NLE
DIBENZOFURAN	NLE	NLE	NLE	NLE	NLE	NLE
DIETHYL PHTHALATE	24.8	NLE	NLE	NLE	NLE	NLE
DIMETHYL PHTHALATE	NLE	NLE	NLE	NLE	NLE	NLE
DI-N-BUTYL PHTHALATE	0.15	NLE	NLE	NLE	NLE	NLE
DI-N-OCTYL PHTHALATE	NLE	NLE	NLE	NLE	NLE	NLE
FLUORANTHENE	122	NLE	NLE	NLE	NLE	NLE
FLUORENE	122	NLE	NLE	NLE	NLE	NLE
HEXACHLORO BENZENE	0.199	NLE	NLE	NLE	NLE	NLE
HEXACHLOROBUTADIENE	0.0398	NLE	NLE	NLE	NLE	NLE
HEXACHLOROCYCLOPENTADIENE	0.755	NLE	NLE	NLE	NLE	NLE
HEXACHLOROETHANE	0.596	NLE	NLE	NLE	NLE	NLE
INDENO(1,2,3-CD)PYRENE	109	NLE	NLE	NLE	NLE	NLE
ISOPHORONE	139	NLE	NLE	NLE	NLE	NLE
NAPHTHALENE	0.0994	NLE	NLE	NLE	NLE	NLE
NITROBENZENE	1.31	NLE	NLE	NLE	NLE	NLE
N-NITROSO-DI-N-PROPYLAMINE	NLE	NLE	NLE	NLE	NLE	NLE
N-NITROSODIPHENYLAMINE	0.545	NLE	NLE	NLE	NLE	NLE
PENTACHLOROPHENOL	0.119	3	5	2.8	31	2.1
PHENANTHRENE	45.7	NLE	NLE	NLE	NLE	NLE
PHENOL	30	NLE	NLE	NLE	NLE	NLE
PYRENE	78.5	NLE	NLE	NLE	NLE	NLE
<b>Polychlorinated Biphenyls (PCB)</b>						
AROCLOR-1016	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1221	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1232	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1242	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1248	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1254	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1260	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1262	0.00332(C)	40	NLE	NLE	NLE	NLE
AROCLOR-1268	0.00332(C)	40	NLE	NLE	NLE	NLE
<b>Pesticides</b>						

Table 2-11  
SUMMARY OF SOIL SCREENING CRITERIA - ECOLOGICAL  
Area W Site Investigation Report  
ACNAS FUDS, Egg Harbor Township

Parameter	NJDEP <sup>1</sup>		USEPA <sup>2</sup> /NJDEP			
	Wildlife PRGs	Terrestrial Plant Tox Benchmarks	EcoSSLs - Plants	EcoSSLs - Mammalian	EcoSSLs - Soil Invertebrates	EcoSSLs - Avian
4,4-DDD	0.758	NLE	NLE	NLE	NLE	NLE
4,4-DDE	0.596	NLE	NLE	NLE	NLE	NLE
4,4-DDT	0.0035	NLE	NLE	0.021(B)	NLE	0.093(B)
ALDRIN	0.00332	NLE	NLE	NLE	NLE	NLE
ALPHA-BHC	0.0994	NLE	NLE	NLE	NLE	NLE
ALPHA-CHLORDANE	NLE	NLE	NLE	NLE	NLE	NLE
BETA-BHC	0.00398	NLE	NLE	NLE	NLE	NLE
DELTA-BHC	NLE	NLE	NLE	NLE	NLE	NLE
DIELDRIN	0.00238	NLE	NLE	0.0049	NLE	0.022
ENDOSULFAN I	NLE	NLE	NLE	NLE	NLE	NLE
ENDOSULFAN II	NLE	NLE	NLE	NLE	NLE	NLE
ENDOSULFAN SULFATE	0.0358	NLE	NLE	NLE	NLE	NLE
ENDRIN	0.0101	NLE	NLE	NLE	NLE	NLE
ENDRIN ALDEHYDE	0.0105	NLE	NLE	NLE	NLE	NLE
ENDRIN KETONE	NLE	NLE	NLE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.005	NLE	NLE	NLE	NLE	NLE
HEPTACHLOR	0.00598	NLE	NLE	NLE	NLE	NLE
HEPTACHLOR EPOXIDE	0.152	NLE	NLE	NLE	NLE	NLE
METHOXYCHLOR	0.0199	NLE	NLE	NLE	NLE	NLE
TOXAPHENE	0.119	NLE	NLE	NLE	NLE	NLE
TRANS-CHLORDANE	NLE	NLE	NLE	NLE	NLE	NLE
<b>Metals</b>						
ARSENIC	9.9	10	18	46	NLE	43
CADMIUM	4	4	32	0.36	140	0.77
ALUMINUM	NLE	50	NLE	NLE	NLE	NLE
ANTIMONY	5	5	NLE	0.27	78	NLE
BARIUM	283	500	NLE	2000	330	NLE
BERYLLIUM	10	10	NLE	21	40	NLE
CALCIUM	NLE	NLE	NLE	NLE	NLE	NLE
CHROMIUM	0.4	1	NLE	NLE	26	34
COBALT	0.14	20	13	230	NLE	120
COPPER	5.4	100	70	49	80	28
IRON	NLE	NLE	NLE	NLE	NLE	NLE
LEAD	0.0537	50	120	56	1700	11
MAGNESIUM	NLE	NLE	NLE	NLE	NLE	NLE
MANGANESE	NLE	500	220	4000	450	4300
MERCURY	0.1(E)	0.3	NLE	NLE	NLE	NLE
METHYL MERCURY	NLE	NLE	NLE	NLE	NLE	NLE
NICKEL	13.6	30	38	130	280	210
POTASSIUM	NLE	NLE	NLE	NLE	NLE	NLE
SELENIUM	0.0276	1	0.52	0.63	4.1	1.2
SILVER	2	2	560	14	NLE	4.2
SODIUM	NLE	NLE	NLE	NLE	NLE	NLE
THALLIUM	1	1	NLE	NLE	NLE	NLE
VANADIUM	2	2	NLE	280	NLE	7.8
ZINC	6.62	50	160	79	120	46
<b>Inorganics</b>						
CYANIDE, TOTAL	1.33	NLE	NLE	NLE	NLE	NLE

Notes:

All results are in mg/kg unless otherwise noted.

- NJDEP Ecological Screening Criteria 3/10/2009
- USEPA Ecological Soil Screening Levels (EcoSSLs), 2005

(A) - Values are for P-Cresol  
 (B) - Values for total PCBs  
 (C) - Values for total DDT  
 (D) - Values for Total 1,3-DICHLOROPROPENE  
 (E) - USEPA Region 5 ecological screening level (based on soil invtebrate exposure) utilized instead of the Wildlife PRG value of 0.00051 mg/kg which is based on a woodcock study (not know to be present at Area W).

NLE - No Limits Established  
 mg/kg - miligram / kilogram  
 NJDEP - New Jersey Department of Environmental Protection  
 PRG - Preliminary Remediation Goal  
 USEPA - United States Environmental Protection Agency  
 Eco SSL - Ecological Soil Screening Level

Strictest criteria are shaded



Table 2-12  
SUMMARY OF GROUNDWATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	GWQS	PQL	RSL Tapwater	MCL
<i>Volatile Organic Compounds (VOC)</i>				
1,1,1-TRICHLOROETHANE	30	1	7500	200
1,1,2,2-TETRACHLOROETHANE	1	1	0.066	NLE
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	53000	NLE
1,1,2-TRICHLOROETHANE	3	2	0.24	5
1,1-DICHLOROETHANE	50	1	2.4	NLE
1,1-DICHLOROETHENE	1	1	260	7
1,2,3-TRICHLOROBENZENE	NLE	NLE	5.2	NLE
1,2,4-TRICHLOROBENZENE (VOA)	9	1	0.99	70
1,2-DIBROMO-3-CHLOROPROPANE	0.02	0.02	0.00032	0.2
1,2-DIBROMO-3-CHLOROPROPANE	0.02	0.02	0.00032	0.2
1,2-DICHLOROBENZENE (VOA)	600	5	280	600
1,2-DICHLOROETHANE	2	2	0.15	5
1,2-DICHLOROPROPANE	1	1	0.38	5
1,3-DICHLOROBENZENE (VOA)	600	5	NLE	NLE
1,4-DICHLOROBENZENE (VOA)	75	5	0.42	75
1,4-DIOXANE	10(A)	10(A)	0.67	NLE
2-BUTANONE	300	2	4900	NLE
2-HEXANONE	300(A)	1(A)	34	NLE
4-METHYL-2-PENTANONE	NLE	NLE	1000	NLE
ACETONE	6000	10	12000	NLE
BENZALDEHYDE	NLE	NLE	1500	NLE
BENZENE (VOA)	1	1	0.39	5
BIPHENYL	400	10	0.83	NLE
BROMODICHLOROMETHANE	1	1	0.12	80(C)
BROMOFORM	4	0.8	7.9	80(C)
BROMOMETHANE	10	1	7	NLE
CARBON DISULFIDE	700	1	720	NLE
CARBON TETRACHLORIDE	1	1	0.39	5
CHLOROBENZENE	50	1	72	100
CHLOROBROMOMETHANE	NLE	NLE	83	NLE
CHLOROETHANE	5(A)	0.5(A)	21000	NLE
CHLOROFORM	70	1	0.19	80(C)
CHLOROMETHANE	NLE	NLE	190	NLE
CIS-1,2-DICHLOROETHENE	70	1	28	70
CIS-1,3-DICHLOROPROPENE	1(D)	1(D)	NLE	NLE
CYCLOHEXANE	NLE	NLE	13000	NLE
DIBROMOCHLOROMETHANE	1	1	0.15	80(C)
DICHLORODIFLUOROMETHANE	1000	2	190	NLE
ETHYLBENZENE (VOA)	700	2	1.3	700
ETHYLENE DIBROMIDE	0.03	0.03	0.0065	0.05
ETHYLENE DIBROMIDE	0.03	0.03	0.0065	0.05
ISOPROPYLBENZENE	700	1	390	NLE
M,P-XYLENES (VOA)	NLE	NLE	NLE	NLE
METHYL ACETATE	7000	0.5	16000	NLE
METHYLCYCLOHEXANE	NLE	NLE	NLE	NLE
METHYLENE CHLORIDE	3	1	4.7	5
METHYL-T-BUTYL ETHER (MTBE) (VOA)	70	1	12	NLE
O-XYLENE (VOA)	NLE	NLE	190	NLE
STYRENE	100	2	1100	100
TETRACHLOROETHYLENE	1	1	0.072	5
TOLUENE (VOA)	600	1	860	1000
TRANS-1,2-DICHLOROETHENE	100	1	86	100
TRANS-1,3-DICHLOROPROPENE	1(D)	1(D)	NLE	NLE
TRICHLOROETHYLENE (TCE)	1	1	0.44	5
TRICHLOROFLUOROMETHANE	2000	1	1100	NLE

Table 2-12  
SUMMARY OF GROUNDWATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	GWQS	PQL	RSL Tapwater	MCL
VINYL CHLORIDE	1	1	0.015	2
XYLENES (TOTAL) (VOA)	1000	2	190	10000
<b><i>Semivolatile Organic Compounds (SVOC)</i></b>				
1,2,4,5-TETRACHLOROBENZENE	NLE	NLE	1.2	NLE
2,3,4,6-TETRACHLOROPHENOL	200	3	170	NLE
2,4,5-TRICHLOROPHENOL	700	10	890	NLE
2,4,6-TRICHLOROPHENOL	20	20	3.5	NLE
2,4-DICHLOROPHENOL	20	10	35	NLE
2,4-DIMETHYLPHENOL	100	20	270	NLE
2,4-DINITROPHENOL	40	40	30	NLE
2,4-DINITROTOLUENE (BNA)	NLE	NLE	0.2	NLE
2,6-DINITROTOLUENE (BNA)	NLE	NLE	15	NLE
2-CHLORONAPHTHALENE (BNA)	600	10	550	NLE
2-CHLOROPHENOL	40	20	71	NLE
2-METHYLNAPHTHALENE (BNA)	30(A)	10(A)	27	NLE
2-METHYLPHENOL (O-CRESOL)	NLE	NLE	720	NLE
2-NITROANILINE	NLE	NLE	150	NLE
2-NITROPHENOL	NLE	NLE	NLE	NLE
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	1100	NLE
3,3-DICHLOROBENZIDINE	30	30	0.11	NLE
3-NITROANILINE	NLE	NLE	NLE	NLE
4,6-DINITRO-2-METHYLPHENOL	1(A)	1(A)	1.2	NLE
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	100(A)	20(A)	1100	NLE
4-CHLOROANILINE	30	10	0.32	NLE
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	3.3	NLE
4-NITROPHENOL	NLE	NLE	NLE	NLE
ACETOPHENONE	700	10	1500	NLE
ATRAZINE	3	0.1	0.26	3
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	47	NLE
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	7	7	0.012	NLE
BIS(2-CHLOROISOPROPYL)ETHER	300	10	0.31	NLE
BIS(2-ETHYLHEXYL) PHTHALATE	3	3	0.071	6
BUTYLBENZYLPHTHALATE	100	1	14	NLE
CAPROLACTAM	NLE	NLE	7700	NLE
CARBAZOLE	NLE	NLE	NLE	NLE
DIBENZOFURAN (BNA)	NLE	NLE	5.8	NLE
DIETHYL PHTHALATE	6000	1	11000	NLE
DIMETHYL PHTHALATE	100(A)	10(A)	NLE	NLE
DI-N-BUTYL PHTHALATE	700	1	670	NLE
DI-N-OCTYL PHTHALATE	100	10	NLE	NLE
HEXACHLOROBUTADIENE (BNA)	1	1	0.26	NLE
HEXACHLOROCYCLOPENTADIENE	40	0.5	22	50
HEXACHLOROETHANE	7	7	0.79	NLE
ISOPHORONE	40	10	67	NLE
NITROBENZENE (BNA)	6	6	0.12	NLE
N-NITROSO-DI-N-PROPYLAMINE	10	10	0.0093	NLE
N-NITROSODIPHENYLAMINE	10	10	10	NLE
PHENOL	2000	10	4500	NLE
<b><i>SVOC Selected Ion Monitoring</i></b>				
ACENAPHTHENE (SIM)	400	10	400	NLE
ACENAPHTHYLENE (SIM)	NLE	10(A)	NLE	NLE
ANTHRACENE (SIM)	2000	10	1300	NLE
BENZO(A)ANTHRACENE (SIM)	0.1	0.1	0.029	NLE
BENZO(A)PYRENE (SIM)	0.1	0.1	0.0029	0.2

Table 2-12  
SUMMARY OF GROUNDWATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	GWQS	PQL	RSL Tapwater	MCL
BENZO(B)FLUORANTHENE (SIM)	0.2	0.2	0.029	NLE
BENZO(G,H,I)PERYLENE (SIM)	NLE	0.3	NLE	NLE
BENZO(K)FLUORANTHENE (SIM)	0.5	0.3	0.29	NLE
CHRYSENE (SIM)	5	0.2	2.9	NLE
DIBENZ(A,H)ANTHRACENE (SIM)	0.3	0.3	0.0029	NLE
FLUORANTHENE (SIM)	300	10	630	NLE
FLUORENE (SIM)	300	1	220	NLE
HEXACHLOROBENZENE (SIM)	0.02	0.02	0.042	1
INDENO(1,2,3-CD)PYRENE (SIM)	0.2	0.2	0.029	NLE
NAPHTHALENE (SIM)	300	2	0.14	NLE
PENTACHLOROPHENOL	0.3	0.1	0.17	1
PHENANTHRENE (SIM)	NLE	NLE	NLE	NLE
PYRENE (SIM)	200	0.1	87	NLE
<b>Polychlorinated Biphenyls (PCB)</b>				
AROCLOR-1016	0.5(B)	0.5(B)	0.96	0.5(B)
AROCLOR-1221	0.5(B)	0.5(B)	0.0043	0.5(B)
AROCLOR-1232	0.5(B)	0.5(B)	0.0043	0.5(B)
AROCLOR-1242	0.5(B)	0.5(B)	0.034	0.5(B)
AROCLOR-1248	0.5(B)	0.5(B)	0.034	0.5(B)
AROCLOR-1254	0.5(B)	0.5(B)	0.034	0.5(B)
AROCLOR-1260	0.5(B)	0.5(B)	0.034	0.5(B)
AROCLOR-1262	0.5(B)	0.5(B)	0.17(B)	0.5(B)
AROCLOR-1268	0.5(B)	0.5(B)	0.17(B)	0.5(B)
<b>Pesticides</b>				
4,4-DDD	0.1	0.02	0.28	NLE
4,4-DDE	0.1	0.01	0.2	NLE
4,4-DDT	0.1	0.1	0.2	NLE
ALDRIN	0.04	0.04	0.00021	NLE
ALPHA-BHC	0.02	0.02	0.0062	NLE
ALPHA-CHLORDANE	NLE	NLE	NLE	NLE
BETA-BHC	0.04	0.04	0.022	NLE
DELTA-BHC	NLE	NLE	NLE	NLE
DIELDRIN	0.03	0.03	0.0015	NLE
ENDOSULFAN I	40	0.02	NLE	NLE
ENDOSULFAN II	40	0.04	NLE	NLE
ENDOSULFAN SULFATE	40	0.02	NLE	NLE
ENDRIN	2	0.03	1.7	2
ENDRIN ALDEHYDE	NLE	NLE	NLE	NLE
ENDRIN KETONE	NLE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.03	0.02	0.036	0.2
HEPTACHLOR	0.05	0.05	0.0018	0.4
HEPTACHLOR EPOXIDE	0.2	0.2	0.0033	0.2
METHOXYCHLOR	40	0.1	27	40
TOXAPHENE	2	2	0.013	3
TRANS-CHLORDANE	NLE	NLE	NLE	NLE
<b>Metals</b>				
ALUMINUM	200	30	16000	50-200
ALUMINUM (DISSOLVED)	200	30	16000	NLE
ANTIMONY	6	3	6	6
ANTIMONY (DISSOLVED)	6	3	6	6
ARSENIC	3	3	0.045	10
ARSENIC (DISSOLVED)	3	3	0.045	10
BARIUM	6000	200	2900	2000
BARIUM (DISSOLVED)	6000	200	2900	2000
BERYLLIUM	1	1	16	4
BERYLLIUM (DISSOLVED)	1	1	16	4

Table 2-12  
SUMMARY OF GROUNDWATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	GWQS	PQL	RSL Tapwater	MCL
CADMIUM	4	0.5	6.9	5
CADMIUM (DISSOLVED)	4	0.5	6.9	5
CALCIUM	NLE	NLE	NLE	NLE
CALCIUM (DISSOLVED)	NLE	NLE	NLE	NLE
CHROMIUM	70	1	0.031	100
CHROMIUM (DISSOLVED)	70	1	0.031	100
COBALT	100(A)	0.5(A)	4.7	NLE
COBALT (DISSOLVED)	NLE	NLE	4.7	NLE
COPPER	1300	4	620	1300
COPPER (DISSOLVED)	1300	4	620	1300
IRON	300	20	11000	NLE
IRON (DISSOLVED)	300	20	11000	NLE
LEAD	5	5	NLE	15
LEAD (DISSOLVED)	5	5	NLE	15
MAGNESIUM	NLE	NLE	NLE	NLE
MAGNESIUM (DISSOLVED)	NLE	NLE	NLE	NLE
MANGANESE	50	0.4	320	NLE
MANGANESE (DISSOLVED)	50	0.4	320	NLE
MERCURY	2	0.05	0.63	2
MERCURY (DISSOLVED)	2	0.05	0.63	2
MERCURY	2	0.05	0.63	2
MERCURY (DISSOLVED)	2	0.05	0.63	2
METHYL MERCURY	NLE	NLE	1.6	NLE
METHYL MERCURY (DISSOLVED)	NLE	NLE	1.6	NLE
NICKEL	100	4	300	NLE
NICKEL (DISSOLVED)	100	4	300	NLE
POTASSIUM	NLE	NLE	NLE	NLE
POTASSIUM (DISSOLVED)	NLE	NLE	NLE	NLE
SELENIUM	40	4	78	50
SELENIUM (DISSOLVED)	40	4	78	50
SILVER	40	1	71	NLE
SILVER (DISSOLVED)	40	1	71	NLE
SODIUM	50000	400	NLE	NLE
SODIUM (DISSOLVED)	50000	400	NLE	NLE
THALLIUM	2	2	0.16	2
THALLIUM (DISSOLVED)	2	2	0.16	2
VANADIUM	NLE	NLE	NLE	NLE
VANADIUM (DISSOLVED)	NLE	NLE	NLE	NLE
ZINC	2000	10	4700	NLE
ZINC (DISSOLVED)	2000	10	4700	NLE
<b>Inorganics</b>				
CYANIDE (CALORIMETRY)	100	6	310	200

Notes:

All results are in ug/l unless otherwise noted.

(A) - Interim Specific Criteria

(B) - Based on Total PCB

(C) - Based on total of BROMODICHLOROMETHANE, BROMOFORM, CHLOROMETHANE and DIBROMOCHLOROMETHANE

(D) - Based on 1,3-DICHLOROPROPENE

NJDEP - New Jersey Department of Environmental Protection

GWQS - Groundwater quality standard

PQL - Practical quantitation limit

USEPA - United States Environmental Protection Agency

RSL - Regional Screening Level (May 2012)

MCL - Maximum contaminant level

Table 2-13  
SUMMARY OF SURFACE WATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP			USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	2009 FW Aquatic HH	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	NRWQC HH water + organism
<b><i>Volatile Organic Compounds (VOC)</i></b>						
1,1,1-TRICHLOROETHANE	NLE	76	120	NLE	NLE	NLE
1,1,2,2-TETRACHLOROETHANE	NLE	380	4.7	NLE	NLE	0.17
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	NLE	NLE	NLE	NLE
1,1,2-TRICHLOROETHANE	NLE	500	13	NLE	NLE	0.59
1,1-DICHLOROETHANE	NLE	NLE	NLE	NLE	NLE	NLE
1,1-DICHLOROETHENE	NLE	65	4.7	NLE	NLE	330
1,2,3-TRICHLOROBENZENE	NLE	NLE	NLE	NLE	NLE	NLE
1,2,4-TRICHLOROBENZENE (VOA)	NLE	30	21	NLE	NLE	35
1,2-DIBROMO-3-CHLOROPROPANE	NLE	NLE	NLE	NLE	NLE	NLE
1,2-DICHLOROBENZENE (VOA)	NLE	14	2000	NLE	NLE	420
1,2-DICHLOROETHANE	NLE	910	0.29	NLE	NLE	0.38
1,2-DICHLOROPROPANE	NLE	360	0.5	NLE	NLE	0.5
1,3-DICHLOROBENZENE (VOA)	NLE	38	2200	NLE	NLE	320
1,4-DICHLOROBENZENE (VOA)	NLE	9.4	550	NLE	NLE	63
1,4-DIOXANE	NLE	NLE	NLE	NLE	NLE	NLE
2-BUTANONE	NLE	NLE	NLE	NLE	NLE	NLE
2-HEXANONE	NLE	NLE	NLE	NLE	NLE	NLE
4-METHYL-2-PENTANONE	NLE	NLE	NLE	NLE	NLE	NLE
ACETONE	NLE	NLE	NLE	NLE	NLE	NLE
BENZALDEHYDE	NLE	NLE	NLE	NLE	NLE	NLE
BENZENE (VOA)	NLE	114	0.15	NLE	NLE	2.2
BIPHENYL	NLE	NLE	NLE	NLE	NLE	NLE
BROMODICHLOROMETHANE	NLE	NLE	0.55	NLE	NLE	0.55
BROMOFORM	NLE	230	4.3	NLE	NLE	4.3
BROMOMETHANE	NLE	16	47	NLE	NLE	47
CARBON DISULFIDE	NLE	NLE	NLE	NLE	NLE	NLE
CARBON TETRACHLORIDE	NLE	240	0.33	NLE	NLE	0.23
CHLOROBENZENE	NLE	47	210	NLE	NLE	130
CHLOROBROMOMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
CHLOROETHANE	NLE	NLE	NLE	NLE	NLE	NLE
CHLOROFORM	NLE	140	68	NLE	NLE	5.7
CHLOROMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
CIS-1,2-DICHLOROETHENE	NLE	NLE	NLE	NLE	NLE	NLE
CIS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE	NLE	0.34(F)
CYCLOHEXANE	NLE	NLE	NLE	NLE	NLE	NLE
DIBROMOCHLOROMETHANE	NLE	NLE	0.4	NLE	NLE	0.4
DICHLORODIFLUOROMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
ETHYLBENZENE (VOA)	NLE	14	530	NLE	NLE	530
ETHYLENE DIBROMIDE	NLE	NLE	NLE	NLE	NLE	NLE
ISOPROPYLBENZENE	NLE	NLE	NLE	NLE	NLE	NLE
M,P-XYLENES (VOA)	NLE	NLE	NLE	NLE	NLE	NLE
METHYL ACETATE	NLE	NLE	NLE	NLE	NLE	NLE
METHYLCYCLOHEXANE	NLE	NLE	NLE	NLE	NLE	NLE
METHYLENE CHLORIDE	NLE	940	2.5	NLE	NLE	4.6
METHYL-T-BUTYL ETHER (MTBE) (VOA)	51000	51000	70	NLE	NLE	NLE
O-XYLENE (VOA)	NLE	NLE	NLE	NLE	NLE	NLE
STYRENE	NLE	32	NLE	NLE	NLE	NLE
TETRACHLOROETHYLENE	NLE	45	0.34	NLE	NLE	0.69
TOLUENE (VOA)	NLE	253	1300	NLE	NLE	1300
TRANS-1,2-DICHLOROETHENE	NLE	970	590	NLE	NLE	140
TRANS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE	NLE	0.34(F)
TRICHLOROETHYLENE (TCE)	NLE	47	1	NLE	NLE	2.5
TRICHLOROFUOROMETHANE	NLE	NLE	NLE	NLE	NLE	NLE
VINYL CHLORIDE	NLE	930	0.082	NLE	NLE	0.025
XYLENES (TOTAL) (VOA)	NLE	27	NLE	NLE	NLE	NLE
<b><i>Semivolatile Organic Compounds (SVOC)</i></b>						
1,2,4,5-TETRACHLOROBENZENE	NLE	3	0.97	NLE	NLE	0.97
2,3,4,6-TETRACHLOROPHENOL	NLE	NLE	NLE	NLE	NLE	NLE
2,4,5-TRICHLOROPHENOL	NLE	NLE	1800	NLE	NLE	1800
2,4,6-TRICHLOROPHENOL	NLE	4.9	0.58	NLE	NLE	1.4
2,4-DICHLOROPHENOL	NLE	11	77	NLE	NLE	77
2,4-DIMETHYLPHENOL	NLE	100	380	NLE	NLE	380
2,4-DINITROPHENOL	NLE	19	69	NLE	NLE	69
2,4-DINITROTOLUENE (BNA)	NLE	44	0.11	NLE	NLE	0.11
2,6-DINITROTOLUENE (BNA)	NLE	NLE	NLE	NLE	NLE	NLE

Table 2-13  
SUMMARY OF SURFACE WATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP			USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	2009 FW Aquatic HH	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	NRWQC HH water + organism
2-CHLORONAPHTHALENE (BNA)	NLE	0.396	1000	NLE	NLE	1000
2-CHLOROPHENOL	NLE	24	81	NLE	NLE	81
2-METHYLNAPHTHALENE (BNA)	NLE	330	NLE	NLE	NLE	NLE
2-METHYLPHENOL (O-CRESOL)	NLE	NLE	NLE	NLE	NLE	NLE
2-NITROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
2-NITROPHENOL	NLE	NLE	NLE	NLE	NLE	NLE
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	NLE	NLE	NLE	NLE
3,3-DICHLORO BENZIDINE	NLE	4.5	0.021	NLE	NLE	0.021
3-NITROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
4,6-DINITRO-2-METHYLPHENOL	NLE	NLE	13	NLE	NLE	13
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE	NLE
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	NLE	NLE	NLE	NLE	NLE	NLE
4-CHLOROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	NLE	NLE	NLE	NLE
4-NITROPHENOL	NLE	60	NLE	NLE	NLE	NLE
ACETOPHENONE	NLE	NLE	NLE	NLE	NLE	NLE
ATRAZINE	NLE	NLE	NLE	NLE	NLE	NLE
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	NLE	NLE	NLE	NLE
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	NLE	1900	0.03	NLE	NLE	0.03
BIS(2-CHLOROISOPROPYL) ETHER	NLE	NLE	1400	NLE	NLE	1400
BIS(2-ETHYLHEXYL) PHTHALATE	NLE	0.3	1.2	NLE	NLE	1.2
BUTYLBENZYL PHTHALATE	NLE	23	150	NLE	NLE	1500
CAPROLACTAM	NLE	NLE	NLE	NLE	NLE	NLE
CARBAZOLE	NLE	NLE	NLE	NLE	NLE	NLE
DIBENZOFURAN (BNA)	NLE	NLE	NLE	NLE	NLE	NLE
DIETHYL PHTHALATE	NLE	110	17000	NLE	NLE	17000
DIMETHYL PHTHALATE	NLE	NLE	NLE	NLE	NLE	270000
DI-N-BUTYL PHTHALATE	NLE	9.7	2000	NLE	NLE	2000
DI-N-OCTYL PHTHALATE	NLE	NLE	NLE	NLE	NLE	NLE
HEXACHLOROBUTADIENE (BNA)	NLE	0.053	0.44	NLE	NLE	0.44
HEXACHLOROCYCLOPENTADIENE	NLE	77	40	NLE	NLE	40
HEXACHLOROETHANE	NLE	8	1.4	NLE	NLE	1.4
ISOPHORONE	NLE	920	35	NLE	NLE	35
NITROBENZENE (BNA)	NLE	220	17	NLE	NLE	17
N-NITROSO-DI-N-PROPYLAMINE	NLE	NLE	0.005	NLE	NLE	0.005
N-NITROSODIPHENYLAMINE	NLE	NLE	3.3	NLE	NLE	3.3
PHENOL	NLE	180	10000	NLE	NLE	10000
<b>SVOC Selected Ion Monitoring</b>						
ACENAPHTHENE (SIM)	NLE	38	670	NLE	NLE	670
ACENAPHTHYLENE (SIM)	NLE	4840	NLE	NLE	NLE	NLE
ANTHRACENE (SIM)	NLE	0.035	8300	NLE	NLE	8300
BENZO(C)ANTHRACENE (SIM)	NLE	0.025	0.038	NLE	NLE	0.0038
BENZO(C)PYRENE (SIM)	NLE	0.014	0.0038	NLE	NLE	0.0038
BENZO(E)FLUORANTHENE (SIM)	NLE	9.07	0.038	NLE	NLE	0.0038
BENZO(G,H,I)PERYLENE (SIM)	NLE	7.64	NLE	NLE	NLE	NLE
BENZO(K)FLUORANTHENE (SIM)	NLE	NLE	0.38	NLE	NLE	0.0038
CHRYSENE (SIM)	NLE	NLE	3.8	NLE	NLE	0.0038
DIBENZ(A,H)ANTHRACENE (SIM)	NLE	NLE	0.0038	NLE	NLE	0.0038
FLUORANTHENE (SIM)	NLE	1.9	130	NLE	NLE	130
FLUORENE (SIM)	NLE	19	1100	NLE	NLE	1100
HEXACHLOROBENZENE (SIM)	NLE	0.0003	0.00028	NLE	NLE	0.00028
INDENO(1,2,3-CD)PYRENE (SIM)	NLE	4.31	0.038	NLE	NLE	0.0038
NAPHTHALENE (SIM)	NLE	13	NLE	NLE	NLE	NLE
PENTACHLOROPHENOL	NLE	NLE	0.27	15	19	0.27
PHENANTHRENE (SIM)	NLE	3.6	NLE	NLE	NLE	NLE
PYRENE (SIM)	NLE	0.3	830	NLE	NLE	830
<b>Polychlorinated Biphenyls (PCB)</b>						
AROCLOR-1016	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1221	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1232	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1242	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1248	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1254	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1260	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
AROCLOR-1262	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)

Table 2-13  
SUMMARY OF SURFACE WATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP			USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	2009 FW Aquatic HH	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	NRWQC HH water + organism
AROCOR-1268	NLE	0.014(C)	0.000064(C)	0.014(C)	NLE	0.000064(C)
<b>Pesticides</b>						
4,4-DDD	NLE	NLE	0.00031	NLE	NLE	0.00031
4,4-DDE	NLE	4.51E-09	0.00022	NLE	NLE	0.00022
4,4-DDT	1.1	0.001	0.00022	0.001	1.1	0.00022
ALDRIN	3	0.017	0.000049	NLE	3	0.000049
ALPHA-BHC	NLE	12.4	0.0026	NLE	NLE	0.0026
ALPHA-CHLORDANE	NLE	NLE	NLE	NLE	NLE	NLE
BETA-BHC	NLE	0.495	0.0091	NLE	NLE	0.0091
DELTA-BHC	NLE	NLE	NLE	NLE	NLE	NLE
DIELDRIN	0.24	0.056	0.000052	0.056	0.24	0.000052
ENDOSULFAN I	0.22(G)	0.056(G)	62(G)	0.056	0.22	62
ENDOSULFAN II	0.22(G)	0.056(G)	62 (G)	0.056	0.22	62
ENDOSULFAN SULFATE	NLE	2.22	62	NLE	NLE	62
ENDRIN	0.086	0.036	0.059	0.036	0.086	0.059
ENDRIN ALDEHYDE	NLE	0.15	0.059	NLE	NLE	0.29
ENDRIN KETONE	NLE	NLE	NLE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.95	0.026	0.98	NLE	0.95	0.98
HEPTACHLOR	0.52	0.0038	0.000079	0.0038	0.52	0.000079
HEPTACHLOR EPOXIDE	0.52	0.0038	0.000039	0.0038	0.52	0.000039
METHOXYCHLOR	NLE	0.03	40	0.03	NLE	100
TOXAPHENE	0.73	0.0002	0.00028	0.0002	0.73	0.00028
TRANS-CHLORDANE	NLE	NLE	NLE	NLE	NLE	NLE
<b>Metals</b>						
ALUMINUM	NLE	NLE	NLE	87	750	NLE
ALUMINUM (DISSOLVED)	NLE	NLE	NLE	87	750	NLE
ANTIMONY	NLE	80	5.6	NLE	NLE	5.6
ANTIMONY (DISSOLVED)	NLE	80	5.6	NLE	NLE	5.6
ARSENIC	340	150	0.017	150	340	0.018
ARSENIC (DISSOLVED)	340	150	0.017	150	340	0.018
BARIUM	NLE	220	2000	NLE	NLE	1000
BARIUM (DISSOLVED)	NLE	220	2000	NLE	NLE	1000
BERYLLIUM	NLE	3.6	6	NLE	NLE	NLE
BERYLLIUM (DISSOLVED)	NLE	3.6	6	NLE	NLE	NLE
CADMIUM	10.532	1.717	3.4	0.25	2	NLE
CADMIUM (DISSOLVED)	10.532	1.717	3.4	0.25	2	NLE
CALCIUM	NLE	NLE	NLE	NLE	NLE	NLE
CALCIUM (DISSOLVED)	NLE	NLE	NLE	NLE	NLE	NLE
CHROMIUM	15	10	92	16	11	0.1
CHROMIUM (DISSOLVED)	15	10	92	16	11	0.1
COBALT	NLE	24	NLE	NLE	NLE	NLE
COBALT (DISSOLVED)	NLE	24	NLE	NLE	NLE	NLE
COPPER	76.777	43.766	1300	NLE	NLE	NLE
COPPER (DISSOLVED)	76.777	43.766	1300	NLE	NLE	NLE
IRON	NLE	NLE	NLE	1000	NLE	NLE
IRON (DISSOLVED)	NLE	NLE	NLE	NLE	NLE	NLE
LEAD	38	5.4	5	2.5	65	NLE
LEAD (DISSOLVED)	38	5.4	5	2.5	65	NLE
MAGNESIUM	NLE	NLE	NLE	NLE	NLE	NLE
MAGNESIUM (DISSOLVED)	NLE	NLE	NLE	NLE	NLE	NLE
MANGANESE	NLE	NLE	NLE	NLE	NLE	50
MANGANESE (DISSOLVED)	NLE	NLE	NLE	NLE	NLE	50
MERCURY	1.4	0.77	0.05	0.77	1.4	0.3
MERCURY (DISSOLVED)	1.4	0.77	0.05	0.77	1.4	0.3
MERCURY	1.4	0.77	0.05	0.77	1.4	0.3
MERCURY (DISSOLVED)	1.4	0.77	0.05	0.77	1.4	0.3
METHYL MERCURY	NLE	NLE	NLE	0.77	1.4	0.3
METHYL MERCURY (DISSOLVED)	NLE	NLE	NLE	0.77	1.4	0.3
NICKEL	1972.922	220.239	500	52	470	610
NICKEL (DISSOLVED)	1972.922	220.239	500	52	470	610
POTASSIUM	NLE	NLE	NLE	NLE	NLE	NLE
POTASSIUM (DISSOLVED)	NLE	NLE	NLE	NLE	NLE	NLE
SELENIUM	20	5	170	5	NLE	170
SELENIUM (DISSOLVED)	20	5	170	5	NLE	170
SILVER	84.72	0.12	170	NLE	3.2	NLE
SILVER (DISSOLVED)	84.72	0.12	170	NLE	3.2	NLE

Table 2-13  
SUMMARY OF SURFACE WATER SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP			USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	2009 FW Aquatic HH	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	NRWQC HH water + organism
SODIUM	NLE	NLE	NLE	NLE	NLE	NLE
SODIUM (DISSOLVED)	NLE	NLE	NLE	NLE	NLE	NLE
THALLIUM	NLE	10	0.24	NLE	NLE	0.24
THALLIUM (DISSOLVED)	NLE	10	0.24	NLE	NLE	0.24
VANADIUM	NLE	12	NLE	NLE	NLE	NLE
VANADIUM (DISSOLVED)	NLE	12	NLE	NLE	NLE	NLE
ZINC	567.885	567.885	7400	120	120	7400
ZINC (DISSOLVED)	567.885	567.885	7400	120	120	7400
<b>Inorganics</b>						
CYANIDE (CALORIMETRY)	22	5.2	140	5.2	22	140

Notes:

All results are in ug/l unless otherwise noted.

(A) - Based on 4-methylphenol

(B) - Based on 57-74-9 for alpha-chlordane and gamma-chlordane

(C) - Based on total PCBs

(D) - Based on Hardness = 100

(E) - Based on 1,2-dichloroethene, CAS# 540-59-0

(F) - Based on 1,3-dichloropropene, CAS# 542-75-6

(G) - Based on Endosulfans (Alpha and Beta)

(H) -Based on pH= 7.8

NJDEP - New Jersey Department of Environmental Protection

FW - Freshwater

HH - Human health

USEPA - United States Environmental Protection Agency

NRWQC - National recommended water quality criteria

CCC - Criterion continuous concentration

CMC - Criteria maximum concentration

Strictest criteria are shaded



Table 2-14  
SUMMARY OF SURFACE WATER SCREENING CRITERIA - ECOLOGICAL

Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	Region III BTAG Fresh Water Screening Benchmarks
<b><i>Volatile Organic Compounds (VOC)</i></b>					
1,1,1-TRICHLOROETHANE	NLE	76	NLE	NLE	11
1,1,2,2-TETRACHLOROETHANE	NLE	380	NLE	NLE	610
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	NLE	NLE	NLE
1,1,2-TRICHLOROETHANE	NLE	500	NLE	NLE	1200
1,1-DICHLOROETHANE	NLE	NLE	NLE	NLE	47
1,1-DICHLOROETHENE	NLE	65	NLE	NLE	25
1,2,3-TRICHLOROBENZENE	NLE	NLE	NLE	NLE	8
1,2,4-TRICHLOROBENZENE (VOA)	NLE	30	NLE	NLE	24
1,2-DIBROMO-3-CHLOROPROPANE	NLE	NLE	NLE	NLE	NLE
1,2-DICHLOROBENZENE (VOA)	NLE	14	NLE	NLE	0.7
1,2-DICHLOROETHANE	NLE	910	NLE	NLE	100
1,2-DICHLOROPROPANE	NLE	360	NLE	NLE	NLE
1,3-DICHLOROBENZENE (VOA)	NLE	38	NLE	NLE	150
1,4-DICHLOROBENZENE (VOA)	NLE	9.4	NLE	NLE	26
1,4-DIOXANE	NLE	NLE	NLE	NLE	NLE
2-BUTANONE	NLE	NLE	NLE	NLE	14000
2-HEXANONE	NLE	NLE	NLE	NLE	99
4-METHYL-2-PENTANONE	NLE	NLE	NLE	NLE	170
ACETONE	NLE	NLE	NLE	NLE	1500
BENZALDEHYDE	NLE	NLE	NLE	NLE	NLE
BENZENE (VOA)	NLE	114	NLE	NLE	370
BIPHENYL	NLE	NLE	NLE	NLE	14
BROMODICHLOROMETHANE	NLE	NLE	NLE	NLE	NLE
BROMOFORM	NLE	230	NLE	NLE	320
BROMOMETHANE	NLE	16	NLE	NLE	NLE
CARBON DISULFIDE	NLE	NLE	NLE	NLE	0.92
CARBON TETRACHLORIDE	NLE	240	NLE	NLE	13.3
CHLOROBENZENE	NLE	47	NLE	NLE	1.3
CHLOROBROMOMETHANE	NLE	NLE	NLE	NLE	NLE
CHLOROETHANE	NLE	NLE	NLE	NLE	NLE
CHLOROFORM	NLE	140	NLE	NLE	1.8
CHLOROMETHANE	NLE	NLE	NLE	NLE	NLE
CIS-1,2-DICHLOROETHENE	NLE	NLE	NLE	NLE	590
CIS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE	0.055(F)
CYCLOHEXANE	NLE	NLE	NLE	NLE	NLE
DIBROMOCHLOROMETHANE	NLE	NLE	NLE	NLE	NLE
DICHLORODIFLUOROMETHANE	NLE	NLE	NLE	NLE	NLE
ETHYLBENZENE (VOA)	NLE	14	NLE	NLE	90
ETHYLENE DIBROMIDE	NLE	NLE	NLE	NLE	NLE
ISOPROPYLBENZENE	NLE	NLE	NLE	NLE	2.6
M,P-XYLENES (VOA)	NLE	NLE	NLE	NLE	NLE
METHYL ACETATE	NLE	NLE	NLE	NLE	NLE
METHYLCYCLOHEXANE	NLE	NLE	NLE	NLE	NLE
METHYLENE CHLORIDE	NLE	940	NLE	NLE	98.1
METHYL-T-BUTYL ETHER (MTBE) (VOA)	51000	51000	NLE	NLE	11070
O-XYLENE (VOA)	NLE	NLE	NLE	NLE	NLE
STYRENE	NLE	32	NLE	NLE	72
TETRACHLOROETHYLENE	NLE	45	NLE	NLE	111
TOLUENE (VOA)	NLE	253	NLE	NLE	2
TRANS-1,2-DICHLOROETHENE	NLE	970	NLE	NLE	970
TRANS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE	0.055(F)
TRICHLOROETHYLENE (TCE)	NLE	47	NLE	NLE	21
TRICHLOROFLUOROMETHANE	NLE	NLE	NLE	NLE	NLE
VINYL CHLORIDE	NLE	930	NLE	NLE	930
XYLENES (TOTAL) (VOA)	NLE	27	NLE	NLE	13
<b><i>Semivolatile Organic Compounds (SVOC)</i></b>					
1,2,4,5-TETRACHLOROBENZENE	NLE	3	NLE	NLE	3
2,3,4,6-TETRACHLOROPHENOL	NLE	NLE	NLE	NLE	1.2
2,4,5-TRICHLOROPHENOL	NLE	NLE	NLE	NLE	NLE
2,4,6-TRICHLOROPHENOL	NLE	4.9	NLE	NLE	4.9
2,4-DICHLOROPHENOL	NLE	11	NLE	NLE	11
2,4-DIMETHYLPHENOL	NLE	100	NLE	NLE	NLE
2,4-DINITROPHENOL	NLE	19	NLE	NLE	NLE

Table 2-14  
SUMMARY OF SURFACE WATER SCREENING CRITERIA - ECOLOGICAL

Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	Region III BTAG Fresh Water Screening Benchmarks
2,4-DINITROTOLUENE (BNA)	NLE	44	NLE	NLE	44
2,6-DINITROTOLUENE (BNA)	NLE	NLE	NLE	NLE	81
2-CHLORONAPHTHALENE (BNA)	NLE	0.396	NLE	NLE	NLE
2-CHLOROPHENOL	NLE	24	NLE	NLE	24
2-METHYLNAPHTHALENE (BNA)	NLE	330	NLE	NLE	4.7
2-METHYLPHENOL (O-CRESOL)	NLE	NLE	NLE	NLE	13
2-NITROANILINE	NLE	NLE	NLE	NLE	NLE
2-NITROPHENOL	NLE	NLE	NLE	NLE	1920
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	NLE	NLE	543(A)
3,3-DICHLOROBENZIDINE	NLE	4.5	NLE	NLE	4.5
3-NITROANILINE	NLE	NLE	NLE	NLE	NLE
4,6-DINITRO-2-METHYLPHENOL	NLE	NLE	NLE	NLE	NLE
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	1.5
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	NLE	NLE	NLE	NLE	NLE
4-CHLOROANILINE	NLE	NLE	NLE	NLE	232
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	NLE	NLE	NLE
4-NITROPHENOL	NLE	60	NLE	NLE	60
ACETOPHENONE	NLE	NLE	NLE	NLE	NLE
ATRAZINE	NLE	NLE	NLE	NLE	1.8
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	NLE	NLE	NLE
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	NLE	1900	NLE	NLE	NLE
BIS(2-CHLOROISOPROPYL)ETHER	NLE	NLE	NLE	NLE	NLE
BIS(2-ETHYLHEXYL) PHTHALATE	NLE	0.3	NLE	NLE	16
BUTYLBENZYLPHTHALATE	NLE	23	NLE	NLE	19
CAPROLACTAM	NLE	NLE	NLE	NLE	NLE
CARBAZOLE	NLE	NLE	NLE	NLE	NLE
DIBENZOFURAN (BNA)	NLE	NLE	NLE	NLE	3.7
DIETHYL PHTHALATE	NLE	110	NLE	NLE	210
DIMETHYL PHTHALATE	NLE	NLE	NLE	NLE	NLE
DI-N-BUTYL PHTHALATE	NLE	9.7	NLE	NLE	19
DI-N-OCTYL PHTHALATE	NLE	NLE	NLE	NLE	22
HEXACHLOROBUTADIENE (BNA)	NLE	0.053	NLE	NLE	1.3
HEXACHLOROCYCLOPENTADIENE	NLE	77	NLE	NLE	NLE
HEXACHLOROETHANE	NLE	8	NLE	NLE	12
ISOPHORONE	NLE	920	NLE	NLE	NLE
NITROBENZENE (BNA)	NLE	220	NLE	NLE	NLE
N-NITROSO-DI-N-PROPYLAMINE	NLE	NLE	NLE	NLE	NLE
N-NITROSODIPHENYLAMINE	NLE	NLE	NLE	NLE	210
PHENOL	NLE	180	NLE	NLE	4
<b>SVOC Selected Ion Monitoring</b>					
ACENAPHTHENE (SIM)	NLE	38	NLE	NLE	5.8
ACENAPHTHYLENE (SIM)	NLE	4840	NLE	NLE	NLE
ANTHRACENE (SIM)	NLE	0.035	NLE	NLE	0.012
BENZO(C)ANTHRACENE (SIM)	NLE	0.025	NLE	NLE	0.018
BENZO(C)PYRENE (SIM)	NLE	0.014	NLE	NLE	0.015
BENZO(E)FLUORANTHENE (SIM)	NLE	9.07	NLE	NLE	NLE
BENZO(G,H,I)PERYLENE (SIM)	NLE	7.64	NLE	NLE	NLE
BENZO(K)FLUORANTHENE (SIM)	NLE	NLE	NLE	NLE	NLE
CHRYSENE (SIM)	NLE	NLE	NLE	NLE	NLE
DIBENZ(A,H)ANTHRACENE (SIM)	NLE	NLE	NLE	NLE	NLE
FLUORANTHENE (SIM)	NLE	1.9	NLE	NLE	0.04
FLUORENE (SIM)	NLE	19	NLE	NLE	3
HEXACHLORO BENZENE (SIM)	NLE	0.0003	NLE	NLE	0.0003
INDENO(1,2,3-CD)PYRENE (SIM)	NLE	4.31	NLE	NLE	NLE
NAPHTHALENE (SIM)	NLE	13	NLE	NLE	1.1
PENTACHLOROPHENOL	NLE	NLE	15	19	0.5(H)
PHENANTHRENE (SIM)	NLE	3.6	NLE	NLE	0.4
PYRENE (SIM)	NLE	0.3	NLE	NLE	0.025
<b>Polychlorinated Biphenyls (PCB)</b>					
AROCLOR-1016	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1221	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1232	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1242	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)

Table 2-14  
SUMMARY OF SURFACE WATER SCREENING CRITERIA - ECOLOGICAL  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	Region III BTAG Fresh Water Screening Benchmarks
AROCLOR-1248	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1254	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1260	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1262	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
AROCLOR-1268	NLE	0.014(C)	0.014(C)	NLE	0.000074(C)
<b>Pesticides</b>					
4,4-DDD	NLE	NLE	NLE	NLE	0.011
4,4-DDE	NLE	4.51E-09	NLE	NLE	NLE
4,4-DDT	1.1	0.001	0.001	1.1	0.0005
ALDRIN	3	0.017	NLE	3	3
ALPHA-BHC	NLE	12.4	NLE	NLE	2.2
ALPHA-CHLORDANE	NLE	NLE	NLE	NLE	0.0022(B)
BETA-BHC	NLE	0.495	NLE	NLE	2.2
DELTA-BHC	NLE	NLE	NLE	NLE	141
DIELDRIN	0.24	0.056	0.056	0.24	0.056
ENDOSULFAN I	0.22(G)	0.056(G)	0.056	0.22	0.051
ENDOSULFAN II	0.22(G)	0.056(G)	0.056	0.22	0.051
ENDOSULFAN SULFATE	NLE	2.22	NLE	NLE	NLE
ENDRIN	0.086	0.036	0.036	0.086	0.036
ENDRIN ALDEHYDE	NLE	0.15	NLE	NLE	NLE
ENDRIN KETONE	NLE	NLE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.95	0.026	NLE	0.95	0.01
HEPTACHLOR	0.52	0.0038	0.0038	0.52	0.0019
HEPTACHLOR EPOXIDE	0.52	0.0038	0.0038	0.52	0.0019
METHOXYCHLOR	NLE	0.03	0.03	NLE	0.019
TOXAPHENE	0.73	0.0002	0.0002	0.73	0.0002
TRANS-CHLORDANE	NLE	NLE	NLE	NLE	NLE
<b>Metals</b>					
ALUMINUM	NLE	NLE	87	750	87
ALUMINUM (DISSOLVED)	NLE	NLE	87	750	87
ANTIMONY	NLE	80	NLE	NLE	30
ANTIMONY (DISSOLVED)	NLE	80	NLE	NLE	30
ARSENIC	340	150	150	340	5
ARSENIC (DISSOLVED)	340	150	150	340	5
BARIUM	NLE	220	NLE	NLE	4
BARIUM (DISSOLVED)	NLE	220	NLE	NLE	4
BERYLLIUM	NLE	3.6	NLE	NLE	0.66
BERYLLIUM (DISSOLVED)	NLE	3.6	NLE	NLE	0.66
CADMIUM (I)	10.532	1.717	0.25	2	0.25(D)
CADMIUM (DISSOLVED) (I)	10.532	1.717	0.25	2	0.25(D)
CALCIUM	NLE	NLE	NLE	NLE	116000
CALCIUM (DISSOLVED)	NLE	NLE	NLE	NLE	116000
CHROMIUM	15	10	16	11	85(D)
CHROMIUM (DISSOLVED)	15	10	16	11	85(D)
COBALT	NLE	24	NLE	NLE	23(E)
COBALT (DISSOLVED)	NLE	24	NLE	NLE	23(E)
COPPER (I)	76.777	43.766	NLE	NLE	9(D)
COPPER (DISSOLVED) (I)	76.777	43.766	NLE	NLE	9(D)
IRON	NLE	NLE	1000	NLE	300
IRON (DISSOLVED)	NLE	NLE	NLE	NLE	300
LEAD	38	5.4	2.5	65	2.5(D)
LEAD (DISSOLVED)	38	5.4	2.5	65	2.5(D)
MAGNESIUM	NLE	NLE	NLE	NLE	82000
MAGNESIUM (DISSOLVED)	NLE	NLE	NLE	NLE	82000
MANGANESE	NLE	NLE	NLE	NLE	120
MANGANESE (DISSOLVED)	NLE	NLE	NLE	NLE	120
MERCURY	1.4	0.77	0.77	1.4	0.026
MERCURY (DISSOLVED)	1.4	0.77	0.77	1.4	0.026
MERCURY	1.4	0.77	0.77	1.4	0.026
MERCURY (DISSOLVED)	1.4	0.77	0.77	1.4	0.026
METHYL MERCURY	NLE	NLE	0.77	1.4	0.004
METHYL MERCURY (DISSOLVED)	NLE	NLE	0.77	1.4	0.004
NICKEL (I)	1972.922	220.239	52	470	52(D)
NICKEL (DISSOLVED) (I)	1972.922	220.239	52	470	52(D)

Table 2-14  
SUMMARY OF SURFACE WATER SCREENING CRITERIA - ECOLOGICAL  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA		
	2009 FW Aquatic Acute	2009 FW Aquatic Chronic	NRWQC FW CCC Chronic	NRWQC FW CMC Acute	Region III BTAG Fresh Water Screening Benchmarks
POTASSIUM	NLE	NLE	NLE	NLE	53000
POTASSIUM (DISSOLVED)	NLE	NLE	NLE	NLE	53000
SELENIUM	20	5	5	NLE	1
SELENIUM (DISSOLVED)	20	5	5	NLE	1
SILVER (I)	84.72	0.12	NLE	3.2	3.2(D)
SILVER (DISSOLVED) (I)	84.72	0.12	NLE	3.2	3.2(D)
SODIUM	NLE	NLE	NLE	NLE	680000
SODIUM (DISSOLVED)	NLE	NLE	NLE	NLE	680000
THALLIUM	NLE	10	NLE	NLE	0.8
THALLIUM (DISSOLVED)	NLE	10	NLE	NLE	0.8
VANADIUM	NLE	12	NLE	NLE	20
VANADIUM (DISSOLVED)	NLE	12	NLE	NLE	20
ZINC (I)	567.885	567.885	120	120	120
ZINC (DISSOLVED) (I)	567.885	567.885	120	120	120
<b>Inorganics</b>					
CYANIDE (CALORIMETRY)	22	5.2	5.2	22	5

Notes:

All results are in ug/l unless otherwise noted.

(A) - Based on 4-methylphenol

(B) - Based on 57-74-9 for alpha-chlordane and gamma-chlordane

(C) - Based on total PCBs

(D) - Based on Hardness = 100

(E) - Based on 1,2-dichloroethene, CAS# 540-59-0

(F) - Based on 1,3-dichloropropene, CAS# 542-75-6

(G) - Based on Endosulfans (Alpha and Beta)

(H) -Based on pH= 7.8

(I) - An average hardness of 6.5 mg/L was used for the hardness based calculation of the NJDEP criteria for cadmium, copper, nickel, silver, zinc.

NJDEP - New Jersey Department of Environmental Protection

FW - Freshwater

HH - Human health

USEPA - United States Environmental Protection Agency

NRWQC - National recommended water quality criteria

CCC - Criterion continuous concentration

CMC - Criteria maximum concentration

Strictest criteria are shaded

Table 2-15  
SUMMARY OF SEDIMENT SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	LEL	SEL	Soil RSL Resident	Soil RSL Industrial
<b><i>Volatile Organic Compounds (VOC)</i></b>				
1,1,1-TRICHLOROETHANE	0.213	NLE	8700	38000
1,1,2,2-TETRACHLOROETHANE	0.85	NLE	0.56	2.8
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	43000	180000
1,1,2-TRICHLOROETHANE	0.518	NLE	1.1	5.3
1,1-DICHLOROETHANE	NLE	NLE	3.3	17
1,1-DICHLOROETHENE	0.0194	NLE	240	1100
1,2,3-TRICHLOROBENZENE	NLE	NLE	49	490
1,2,4-TRICHLOROBENZENE (VOA)	5.062	NLE	22	99
1,2-DIBROMO-3-CHLOROPROPANE	NLE	NLE	0.0054	0.069
1,2-DICHLOROBENZENE (VOA)	0.294	NLE	1900	9800
1,2-DICHLOROETHANE	0.26	NLE	0.43	2.2
1,2-DICHLOROPROPANE	0.333	NLE	0.94	4.7
1,3-DICHLOROBENZENE (VOA)	1.315	NLE	NLE	NLE
1,4-DICHLOROBENZENE (VOA)	0.318	NLE	2.4	12
1,4-DIOXANE	NLE	NLE	4.9	17
2-BUTANONE	NLE	NLE	28000	200000
2-HEXANONE	NLE	NLE	210	1400
4-METHYL-2-PENTANONE	NLE	NLE	5300	53000
ACETONE	NLE	NLE	61000	630000
BENZENE (VOA)	0.142	NLE	1.1	5.4
BROMODICHLOROMETHANE	NLE	NLE	0.27	1.4
BROMOFORM	0.492	NLE	62	220
BROMOMETHANE	0.00137	NLE	7.3	32
CARBON DISULFIDE	NLE	NLE	820	3700
CARBON TETRACHLORIDE	1.45	NLE	0.61	3
CHLOROBENZENE	0.291	NLE	290	1400
CHLOROBROMOMETHANE	NLE	NLE	160	680
CHLOROETHANE	NLE	NLE	15000	61000
CHLOROFORM	0.121	NLE	0.29	1.5
CHLOROMETHANE	NLE	NLE	120	500
CIS-1,2-DICHLOROETHENE	NLE	NLE	160	2000
CIS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE
CYCLOHEXANE	NLE	NLE	7000	29000
DIBROMOCHLOROMETHANE	NLE	NLE	0.68	3.3
DICHLORODIFLUOROMETHANE	NLE	NLE	94	400
ETHYLBENZENE (VOA)	0.175	NLE	5.4	27
ETHYLENE DIBROMIDE	NLE	NLE	0.034	0.17
ISOPROPYLBENZENE	NLE	NLE	2100	11000
M,P-XYLENES (VOA)	NLE	NLE	NLE	NLE
METHYL ACETATE	NLE	NLE	78000	1000000
METHYLCYCLOHEXANE	NLE	NLE	NLE	NLE
METHYLENE CHLORIDE	0.159	NLE	11	53
METHYL-T-BUTYL ETHER (MTBE) (VOA)	NLE	NLE	43	220
O-XYLENE (VOA)	NLE	NLE	690	3000
STYRENE	0.254	NLE	6300	36000
TETRACHLOROETHYLENE	0.45	NLE	0.55	2.6
TOLUENE (VOA)	1.22	NLE	5000	45000
TRANS-1,2-DICHLOROETHENE	0.654	NLE	150	690
TRANS-1,3-DICHLOROPROPENE	NLE	NLE	NLE	NLE
TRICHLOROETHYLENE (TCE)	0.112	NLE	0.91	6.4
TRICHLOROFLUOROMETHANE	NLE	NLE	790	3400
VINYL CHLORIDE	0.202	NLE	0.06	1.7
XYLENES (TOTAL) (VOA)	0.12	NLE	630	2700
<b><i>Semivolatile Organic Compounds (SVOC)</i></b>				
1,2,4,5-TETRACHLOROBENZENE	1.252	NLE	18	180

Table 2-15  
SUMMARY OF SEDIMENT SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	LEL	SEL	Soil RSL Resident	Soil RSL Industrial
2,3,4,6-TETRACHLOROPHENOL	NLE	NLE	1800	18000
2,4,5-TRICHLOROPHENOL	NLE	NLE	6100	62000
2,4,6-TRICHLOROPHENOL	0.208	NLE	44	160
2,4-DICHLOROPHENOL	0.0817	NLE	180	1800
2,4-DIMETHYLPHENOL	0.304	NLE	1200	12000
2,4-DINITROPHENOL	0.00621	NLE	120	1200
2,4-DINITROTOLUENE (BNA)	0.0144	NLE	1.6	5.5
2,6-DINITROTOLUENE (BNA)	NLE	NLE	61	620
2-CHLORONAPHTHALENE (BNA)	0.417	NLE	6300	82000
2-CHLOROPHENOL	0.0319	NLE	390	5100
2-METHYLNAPHTHALENE (BNA)	0.0202	NLE	310	4100
2-METHYLPHENOL (O-CRESOL)	NLE	NLE	3100	31000
2-NITROANILINE	NLE	NLE	610	6000
2-NITROPHENOL	NLE	NLE	NLE	NLE
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	310	3100
3,3-DICHLOROBENZIDINE	0.127	NLE	1.1	3.8
3-NITROANILINE	NLE	NLE	NLE	NLE
4,6-DINITRO-2-METHYLPHENOL	NLE	NLE	4.9	49
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	NLE	NLE	6100	62000
4-CHLOROANILINE	NLE	NLE	2.4	8.6
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	24	86
4-NITROPHENOL	0.0133	NLE	NLE	NLE
ACETOPHENONE	NLE	NLE	7800	100000
ATRAZINE	NLE	NLE	2.1	7.5
BENZALDEHYDE	NLE	NLE	7800	100000
BIPHENYL	NLE	NLE	51	210
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	180	1800
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	3.52	NLE	0.21	1
BIS(2-CHLOROISOPROPYL)ETHER	NLE	NLE	4.6	22
BIS(2-ETHYLHEXYL) PHTHALATE	0.182	0.75	35	120
BUTYLBENZYLPHTHALATE	1.97	NLE	260	910
CAPROLACTAM	NLE	NLE	31000	310000
CARBAZOLE	NLE	NLE	NLE	NLE
DIBENZOFURAN (BNA)	NLE	NLE	78	1000
DIETHYL PHTHALATE	0.295	NLE	49000	490000
DIMETHYL PHTHALATE	NLE	NLE	NLE	NLE
DI-N-BUTYL PHTHALATE	1.114	0.11	6100	62000
DI-N-OCTYL PHTHALATE	NLE	NLE	NLE	NLE
HEXACHLOROBUTADIENE (BNA)	0.0265	NLE	6.2	22
HEXACHLOROCYCLOPENTADIENE	0.901	NLE	370	3700
HEXACHLOROETHANE	0.584	NLE	12	43
ISOPHORONE	0.432	NLE	510	1800
NITROBENZENE (BNA)	0.145	NLE	4.8	24
N-NITROSO-DI-N-PROPYLAMINE	NLE	NLE	0.069	0.25
N-NITROSODIPHENYLAMINE	NLE	NLE	99	350
PHENOL	0.0491	0.048	18000	180000
<b>SVOC Selected Ion Monitoring</b>				
ACENAPHTHENE (SIM)	0.00671	NLE	3400	33000
ACENAPHTHYLENE (SIM)	0.00587	NLE	NLE	NLE
ANTHRACENE (SIM)	0.0572	370	17000	170000
BENZO(A)ANTHRACENE (SIM)	0.108	1480	0.15	2.1
BENZO(A)PYRENE (SIM)	0.15	1440	0.015	0.21
BENZO(B)FLUORANTHENE (SIM)	10.4	NLE	0.15	2.1
BENZO(G,H,I)PERYLENE (SIM)	0.17	320	NLE	NLE

Table 2-15  
SUMMARY OF SEDIMENT SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	LEL	SEL	Soil RSL Resident	Soil RSL Industrial
BENZO(K)FLUORANTHENE (SIM)	0.24	1340	1.5	21
CHRYSENE (SIM)	0.166	460	15	210
DIBENZ(A,H)ANTHRACENE (SIM)	0.033	130	0.015	0.21
FLUORANTHENE (SIM)	0.423	1020	2300	22000
FLUORENE (SIM)	0.0774	160	2300	22000
HEXACHLOROBENZENE (SIM)	0.02	24	0.3	1.1
INDENO(1,2,3-CD)PYRENE (SIM)	0.2	320	0.15	2.1
NAPHTHALENE (SIM)	0.16	NLE	3.6	18
PENTACHLOROPHENOL	23	NLE	0.89	2.7
PHENANTHRENE (SIM)	0.204	950	NLE	NLE
PYRENE (SIM)	0.195	850	1700	17000
<b>Polychlorinated Biphenyls (PCB)</b>				
AROCLOR-1016	0.007	53	3.9	21
AROCLOR-1221	NLE	NLE	0.14	0.54
AROCLOR-1232	NLE	NLE	0.14	0.54
AROCLOR-1242	NLE	NLE	0.22	0.74
AROCLOR-1248	0.03	150	0.22	0.74
AROCLOR-1254	0.06	34	0.22	0.74
AROCLOR-1260	0.005	24	0.22	0.74
AROCLOR-1262	NLE	NLE	0.22(B)	0.74(B)
AROCLOR-1268	NLE	NLE	0.22(B)	0.74(B)
<b>Pesticides</b>				
4,4-DDD	0.00488	6	2	7.2
4,4-DDE	0.00316	19	1.4	5.1
4,4-DDT	0.00416	71	1.7	7
ALDRIN	0.002	8	0.029	0.1
ALPHA-BHC	0.006	10	0.077	0.27
ALPHA-CHLORDANE	NLE	NLE	NLE	NLE
BETA-BHC	0.005	21	0.27	0.96
DELTA-BHC	NLE	NLE	NLE	NLE
DIELDRIN	0.0019	91	0.03	0.11
ENDOSULFAN I	NLE	NLE	NLE	NLE
ENDOSULFAN II	NLE	NLE	NLE	NLE
ENDOSULFAN SULFATE	0.0346	NLE	NLE	NLE
ENDRIN	0.00222	130	18	180
ENDRIN ALDEHYDE	0.48	NLE	NLE	NLE
ENDRIN KETONE	NLE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.003	1	0.52	2.1
HEPTACHLOR	0.0006	0.01	0.11	0.38
HEPTACHLOR EPOXIDE	0.00247	5	0.053	0.19
METHOXYCHLOR	0.0136	NLE	310	3100
TOXAPHENE	0.000077	NLE	0.44	1.6
TRANS-CHLORDANE	NLE	NLE	NLE	NLE
<b>Metals</b>				
ALUMINUM	25500	NLE	77000	990000
ANTIMONY	NLE	3	31	410
ARSENIC	6	33	0.39	1.6
BARIUM	NLE	NLE	15000	190000
BERYLLIUM	NLE	NLE	160	2000
CADMIUM	0.6	10	70	800
CALCIUM	NLE	NLE	NLE	NLE
CHROMIUM	26	110	0.29	5.6
COBALT	50	NLE	23	300
COPPER	16	110	3100	41000
IRON	NLE	NLE	55000	720000
LEAD	31	250	400	800

Table 2-15  
SUMMARY OF SEDIMENT SCREENING CRITERIA  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA	
	LEL	SEL	Soil RSL Resident	Soil RSL Industrial
MAGNESIUM	NLE	NLE	NLE	NLE
MANGANESE	630	1100	1800	23000
MERCURY	0.174	2	10	43
MERCURY	0.174	2	10	43
METHYL MERCURY	NLE	NLE	7.8	100
NICKEL	16	75	1500	20000
POTASSIUM	NLE	NLE	NLE	NLE
SELENIUM	NLE	NLE	390	5100
SILVER	0.5	NLE	390	5100
SODIUM	NLE	NLE	NLE	NLE
THALLIUM	NLE	NLE	0.78	10
VANADIUM	NLE	NLE	NLE	NLE
ZINC	120	820	23000	310000
<i>Inorganics</i>				
CYANIDE, TOTAL	0.0001	NLE	1600	20000

Notes:

All results are in mg/kg unless otherwise noted.

(A) - Based on Total DDT

(B) - Based on Total PCBs

(C) - Based on 1,3-DICHLOROPROPENE

NJDEP - New Jersey Department of Environmental Protection

LEL - Lowest effect level

SEL - Severe effect level

USEPA - United States Environmental Protection Agency

RSL - Regional screening level (May, 2012)

Strictest criteria are shaded



Table 2-16  
SUMMARY OF SEDIMENT SCREENING CRITERIA - ECOLOGICAL  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA EPA Region III BTAG Screening Levels
	LEL	SEL	
<i>Volatile Organic Compounds (VOC)</i>			
1,1,1-TRICHLOROETHANE	0.213	NLE	0.0302
1,1,2,2-TETRACHLOROETHANE	0.85	NLE	1.36
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NLE	NLE	NLE
1,1,2-TRICHLOROETHANE	0.518	NLE	1.24
1,1-DICHLOROETHANE	NLE	NLE	NLE
1,1-DICHLOROETHENE	0.0194	NLE	0.031
1,2,3-TRICHLOROBENZENE	NLE	NLE	0.858
1,2,4-TRICHLOROBENZENE (VOA)	5.062	NLE	2.1
1,2-DIBROMO-3-CHLOROPROPANE	NLE	NLE	NLE
1,2-DICHLOROBENZENE (VOA)	0.294	NLE	0.0165
1,2-DICHLOROETHANE	0.26	NLE	NLE
1,2-DICHLOROPROPANE	0.333	NLE	NLE
1,3-DICHLOROBENZENE (VOA)	1.315	NLE	4.43
1,4-DICHLOROBENZENE (VOA)	0.318	NLE	0.599
1,4-DIOXANE	NLE	NLE	NLE
2-BUTANONE	NLE	NLE	NLE
2-HEXANONE	NLE	NLE	NLE
4-METHYL-2-PENTANONE	NLE	NLE	NLE
ACETONE	NLE	NLE	NLE
BENZENE (VOA)	0.142	NLE	NLE
BROMODICHLOROMETHANE	NLE	NLE	NLE
BROMOFORM	0.492	NLE	0.654
BROMOMETHANE	0.00137	NLE	NLE
CARBON DISULFIDE	NLE	NLE	0.000851
CARBON TETRACHLORIDE	1.45	NLE	0.0642
CHLOROBENZENE	0.291	NLE	0.00842
CHLOROBROMOMETHANE	NLE	NLE	NLE
CHLOROETHANE	NLE	NLE	NLE
CHLOROFORM	0.121	NLE	NLE
CHLOROMETHANE	NLE	NLE	NLE
CIS-1,2-DICHLOROETHENE	NLE	NLE	NLE
CIS-1,3-DICHLOROPROPENE	NLE	NLE	0.0000509(C)
CYCLOHEXANE	NLE	NLE	NLE
DIBROMOCHLOROMETHANE	NLE	NLE	NLE
DICHLORODIFLUOROMETHANE	NLE	NLE	NLE
ETHYLBENZENE (VOA)	0.175	NLE	1.1
ETHYLENE DIBROMIDE	NLE	NLE	NLE
ISOPROPYLBENZENE	NLE	NLE	0.086
M,P-XYLENES (VOA)	NLE	NLE	NLE
METHYL ACETATE	NLE	NLE	NLE
METHYLCYCLOHEXANE	NLE	NLE	NLE
METHYLENE CHLORIDE	0.159	NLE	NLE
METHYL-T-BUTYL ETHER (MTBE) (VOA)	NLE	NLE	NLE
O-XYLENE (VOA)	NLE	NLE	NLE
STYRENE	0.254	NLE	0.559
TETRACHLOROETHYLENE	0.45	NLE	0.468
TOLUENE (VOA)	1.22	NLE	NLE
TRANS-1,2-DICHLOROETHENE	0.654	NLE	1.05
TRANS-1,3-DICHLOROPROPENE	NLE	NLE	0.0000509(C)

Table 2-16  
SUMMARY OF SEDIMENT SCREENING CRITERIA - ECOLOGICAL  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA EPA Region III BTAG Screening Levels
	LEL	SEL	
TRICHLOROETHYLENE (TCE)	0.112	NLE	0.0969
TRICHLOROFLUOROMETHANE	NLE	NLE	NLE
VINYL CHLORIDE	0.202	NLE	NLE
XYLENES (TOTAL) (VOA)	0.12	NLE	NLE
<i>Semivolatile Organic Compounds (SVOC)</i>			
1,2,4,5-TETRACHLOROBENZENE	1.252	NLE	1.09
2,3,4,6-TETRACHLOROPHENOL	NLE	NLE	0.284
2,4,5-TRICHLOROPHENOL	NLE	NLE	NLE
2,4,6-TRICHLOROPHENOL	0.208	NLE	0.213
2,4-DICHLOROPHENOL	0.0817	NLE	0.117
2,4-DIMETHYLPHENOL	0.304	NLE	0.029
2,4-DINITROPHENOL	0.00621	NLE	NLE
2,4-DINITROTOLUENE (BNA)	0.0144	NLE	0.0416
2,6-DINITROTOLUENE (BNA)	NLE	NLE	NLE
2-CHLORONAPHTHALENE (BNA)	0.417	NLE	NLE
2-CHLOROPHENOL	0.0319	NLE	0.0312
2-METHYLNAPHTHALENE (BNA)	0.0202	NLE	0.0202
2-METHYLPHENOL (O-CRESOL)	NLE	NLE	NLE
2-NITROANILINE	NLE	NLE	NLE
2-NITROPHENOL	NLE	NLE	NLE
3&4-METHYLPHENOL (M&P-CRESOL)	NLE	NLE	0.67
3,3-DICHLOROBENZIDINE	0.127	NLE	0.127
3-NITROANILINE	NLE	NLE	NLE
4,6-DINITRO-2-METHYLPHENOL	NLE	NLE	NLE
4-BROMOPHENYL PHENYL ETHER	NLE	NLE	1.23
4-CHLORO-3-METHYLPHENOL (4-CHLORO-M-CRESOL)	NLE	NLE	NLE
4-CHLOROANILINE	NLE	NLE	NLE
4-CHLOROPHENYL PHENYL ETHER	NLE	NLE	NLE
4-NITROANILINE	NLE	NLE	NLE
4-NITROPHENOL	0.0133	NLE	NLE
ACETOPHENONE	NLE	NLE	NLE
ATRAZINE	NLE	NLE	0.00662
BENZALDEHYDE	NLE	NLE	NLE
BIPHENYL	NLE	NLE	1.22
BIS(2-CHLOROETHOXY)METHANE	NLE	NLE	NLE
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	3.52	NLE	NLE
BIS(2-CHLOROISOPROPYL)ETHER	NLE	NLE	NLE
BIS(2-ETHYLHEXYL) PHTHALATE	0.182	0.75	0.18
BUTYLBENZYLPHTHALATE	1.97	NLE	10.9
CAPROLACTAM	NLE	NLE	NLE
CARBAZOLE	NLE	NLE	NLE
DIBENZOFURAN (BNA)	NLE	NLE	0.415
DIETHYL PHTHALATE	0.295	NLE	0.603
DIMETHYL PHTHALATE	NLE	NLE	NLE
DI-N-BUTYL PHTHALATE	1.114	0.11	6.47
DI-N-OCTYL PHTHALATE	NLE	NLE	NLE
HEXACHLOROBUTADIENE (BNA)	0.0265	NLE	NLE
HEXACHLOROCYCLOPENTADIENE	0.901	NLE	NLE
HEXACHLOROETHANE	0.584	NLE	1.027
ISOPHORONE	0.432	NLE	NLE

Table 2-16  
SUMMARY OF SEDIMENT SCREENING CRITERIA - ECOLOGICAL  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA EPA Region III BTAG Screening Levels
	LEL	SFL	
NITROBENZENE (BNA)	0.145	NLE	NLE
N-NITROSO-DI-N-PROPYLAMINE	NLE	NLE	NLE
N-NITROSODIPHENYLAMINE	NLE	NLE	2.68
PHENOL	0.0491	0.048	0.42
<b>SVOC Selected Ion Monitoring</b>			
ACENAPHTHENE (SIM)	0.00671	NLE	0.0067
ACENAPHTHYLENE (SIM)	0.00587	NLE	0.0059
ANTHRACENE (SIM)	0.0572	370	0.0572
BENZO(A)ANTHRACENE (SIM)	0.108	1480	0.108
BENZO(A)PYRENE (SIM)	0.15	1440	0.15
BENZO(B)FLUORANTHENE (SIM)	10.4	NLE	0.0272
BENZO(G,H,I)PERYLENE (SIM)	0.17	320	0.17
BENZO(K)FLUORANTHENE (SIM)	0.24	1340	0.24
CHRYSENE (SIM)	0.166	460	0.166
DIBENZ(A,H)ANTHRACENE (SIM)	0.033	130	0.033
FLUORANTHENE (SIM)	0.423	1020	0.423
FLUORENE (SIM)	0.0774	160	0.0774
HEXACHLOROBENZENE (SIM)	0.02	24	0.02
INDENO(1,2,3-CD)PYRENE (SIM)	0.2	320	0.017
NAPHTHALENE (SIM)	0.16	NLE	0.176
PENTACHLOROPHENOL	23	NLE	0.504
PHENANTHRENE (SIM)	0.204	950	0.204
PYRENE (SIM)	0.195	850	0.195
<b>Polychlorinated Biphenyls (PCB)</b>			
AROCLOR-1016	0.007	53	0.0598(B)
AROCLOR-1221	NLE	NLE	0.0598(B)
AROCLOR-1232	NLE	NLE	0.0598(B)
AROCLOR-1242	NLE	NLE	0.0598(B)
AROCLOR-1248	0.03	150	0.0598(B)
AROCLOR-1254	0.06	34	0.0598(B)
AROCLOR-1260	0.005	24	0.0598(B)
AROCLOR-1262	NLE	NLE	0.0598(B)
AROCLOR-1268	NLE	NLE	0.0598(B)
<b>Pesticides</b>			
4,4-DDD	0.00488	6	0.00488
4,4-DDE	0.00316	19	0.00316
4,4-DDT	0.00416	71	0.00416(A)
ALDRIN	0.002	8	0.002
ALPHA-BHC	0.006	10	0.006
ALPHA-CHLORDANE	NLE	NLE	NLE
BETA-BHC	0.005	21	0.005
DELTA-BHC	NLE	NLE	6.4
DIELDRIN	0.0019	91	0.0019
ENDOSULFAN I	NLE	NLE	0.0029
ENDOSULFAN II	NLE	NLE	0.014
ENDOSULFAN SULFATE	0.0346	NLE	0.0054
ENDRIN	0.00222	130	0.00222
ENDRIN ALDEHYDE	0.48	NLE	NLE
ENDRIN KETONE	NLE	NLE	NLE
GAMMA BHC (LINDANE)	0.003	1	0.00237

Table 2-16  
SUMMARY OF SEDIMENT SCREENING CRITERIA - ECOLOGICAL  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

Parameter	NJDEP		USEPA EPA Region III BTAG Screening Levels
	LEL	SEL	
HEPTACHLOR	0.0006	0.01	0.068
HEPTACHLOR EPOXIDE	0.00247	5	0.00247
METHOXYCHLOR	0.0136	NLE	0.0187
TOXAPHENE	0.000077	NLE	0.0001
TRANS-CHLORDANE	NLE	NLE	NLE
<b>Metals</b>			
ALUMINUM	25500	NLE	NLE
ANTIMONY	NLE	3	2
ARSENIC	6	33	9.8
BARIUM	NLE	NLE	NLE
BERYLLIUM	NLE	NLE	NLE
CADMIUM	0.6	10	0.99
CALCIUM	NLE	NLE	NLE
CHROMIUM	26	110	43.4
COBALT	50	NLE	50
COPPER	16	110	31.6
IRON	NLE	NLE	20000
LEAD	31	250	35.8
MAGNESIUM	NLE	NLE	NLE
MANGANESE	630	1100	460
MERCURY	0.174	2	0.18
MERCURY	0.174	2	0.18
METHYL MERCURY	NLE	NLE	NLE
NICKEL	16	75	22.7
POTASSIUM	NLE	NLE	NLE
SELENIUM	NLE	NLE	2
SILVER	0.5	NLE	1
SODIUM	NLE	NLE	NLE
THALLIUM	NLE	NLE	NLE
VANADIUM	NLE	NLE	NLE
ZINC	120	820	121
<b>Inorganics</b>			
CYANIDE, TOTAL	0.0001	NLE	0.1

Notes:

Notes:

All results are in mg/kg unless otherwise noted.

(A) - Based on Total DDT

(B) - Based on Total PCBs

(C) - Based on 1,3-DICHLOROPROPENE

NJDEP - New Jersey Department of Environmental Protection

LEL - Lowest effect level

SEL - Severe effect level

USEPA - United States Environmental Protection Agency

Strictest criteria are shaded

**TABLE 3-1**  
**SOIL ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Station: AW-P1-SS-001-01 Field Sample ID: AW-P1-SS-001-01-01-1 Date: 3/1/2011 Units: mg/kg Depth: 0 - 0.5				AW-P1-SS-001-01 AW-P1-SS-001-01-01-2 3/1/2011 mg/kg 0 - 0.5	AW-P1-SS-001-01 AW-P1-SS-001-01-02-1 3/1/2011 mg/kg 4 - 4.5	AW-P1-SS-002-01 AW-P1-SS-002-01-01-1 3/1/2011 mg/kg 0 - 0.5	AW-P1-SS-002-01 AW-P1-SS-002-01-02-1 3/1/2011 mg/kg 6 - 6.5	AW-P1-SS-003-01 AW-P1-SS-003-01-01-1 3/1/2011 mg/kg 0 - 0.5
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>		Duplicate			
<b>Semivolatile Organic Compounds (SVOC)</b>								
BENZO(A)PYRENE	0.015	0.2	ND	0.038 U	0.043 U	0.035 U	0.042 U	0.037 U
DIBENZ(A,H)ANTHRACENE	0.015	0.2	ND	0.038 U	0.043 U	0.035 U	0.042 U	0.037 U
<b>Pesticides</b>								
ALPHA-BHC	0.077	0.002	0.0013	0.0013 U	0.0013 U	0.0012 U	0.0013 U	0.0013 U
<b>Metals</b>								
ALUMINUM	77000	3900	7670	<u>11800</u>	<u>8570</u>	1190	<u>6140</u>	<u>6950</u>
ARSENIC	0.39	19	0.93	<u>1.7</u>	<u>2.6</u>	0.18 J	<u>1.2</u>	<u>0.71</u>
CHROMIUM	0.29	20	9.1	<u>9</u>	<u>13.9</u>	<u>1.5</u>	<u>6.5</u>	<u>8.7</u>

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

mg/kg - milligrams per kilogram

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

1 - U.S. Environmental Protection Agency - strictest of industrial and residential soil screening criteria. Regional Screening Levels (May, 2012). **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - strictest of non-residential direct contact, residential direct contact and impact to groundwater soil screening criteria. Exceedances are underlined.

3 - Exceedances of either USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 3-1**  
**SOIL ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Station: Field Sample ID: Date: Units: Depth:				AW-P1-SS-003-01	AW-P1-SS-004-01	AW-P1-SS-004-01	AW-P1-SS-005-01	AW-P1-SS-005-01	AW-P1-SS-006-01
				AW-P1-SS-003-01-02-1	AW-P1-SS-004-01-01-1	AW-P1-SS-004-01-02-1	AW-P1-SS-005-01-01-1	AW-P1-SS-005-01-02-1	AW-P1-SS-006-01-01-1
				3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				10.5 - 11	0 - 0.5	11.5 - 12	0 - 0.5	12 - 12.5	0 - 0.5
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>						
Semivolatile Organic Compounds (SVOC)									
BENZO(A)PYRENE	0.015	0.2	ND	0.03 U	0.0623	0.041 U	0.0289 J	0.035 U	0.0319 J
DIBENZ(A,H)ANTHRACENE	0.015	0.2	ND	0.03 U	0.0287 J	0.041 U	0.041 U	0.035 U	0.034 U
Pesticides									
ALPHA-BHC	0.077	0.002	0.0013	0.0012 U	0.0014 U	0.0013 U	0.0068	0.0013 U	0.0014 U
Metals									
ALUMINUM	77000	3900	7670	3360	5920	3540	5860	7790	7800
ARSENIC	0.39	19	0.93	0.47	1.6	6.4	2.0	0.94	1.6
CHROMIUM	0.29	20	9.1	6.5	7.7	10.1	6.9	7.8	9.8

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

mg/kg - milligrams per kilogram

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

1 - U.S. Environmental Protection Agency - strictest of industrial and residential soil screening criteria. Regional Screening Levels (May, 2012). **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - strictest of non-residential direct contact, residential direct contact and impact to groundwater soil screening criteria. Exceedances are underlined.

3 - Exceedances of either USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 3-1**  
**SOIL ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Station: AW-P1-SS-006-01 Field Sample ID: AW-P1-SS-006-01-02-1 Date: 3/1/2011 Units: mg/kg Depth: 12 - 12.5				AW-P1-SS-007-01 Background AW-P1-SS-007-01-01-1 3/2/2011 mg/kg 0 - 0.5	AW-P1-SS-007-01 Background AW-P1-SS-007-01-02-1 3/2/2011 mg/kg 6.5 - 7	AW-P1-SS-008-01 Background AW-P1-SS-008-01-01-1 3/2/2011 mg/kg 0 - 0.5	AW-P1-SS-008-01 Background AW-P1-SS-008-01-02-1 3/2/2011 mg/kg 7.5 - 8
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>				
<i>Semivolatile Organic Compounds (SVOC)</i>							
BENZO(A)PYRENE	0.015	0.2	ND	0.044 U	0.033 U	0.034 U	0.033 U
DIBENZ(A,H)ANTHRACENE	0.015	0.2	ND	0.044 U	0.033 U	0.034 U	0.033 U
<i>Pesticides</i>							
ALPHA-BHC	0.077	0.002	0.0013	0.0013 U	0.0012 U	0.0012 U	0.0013 U
<i>Metals</i>							
ALUMINUM	77000	3900	7670	<u>14300</u>	<u>5030</u>	1530	3820 J
ARSENIC	0.39	19	0.93	<b>2.6</b>	<b>0.86</b>	0.27	<b>0.7</b>
CHROMIUM	0.29	20	9.1	<b>14.8</b>	<b>5.6</b>	<b>2.4</b>	<b>4.7</b>

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

mg/kg - milligrams per kilogram

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

1 - U.S. Environmental Protection Agency - strictest of industrial and residential soil screening criteria. Regional Screening Levels (May, 2012). **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - strictest of non-residential direct contact, residential direct contact and impact to groundwater soil screening criteria. Exceedances are underlined.

3 - Exceedances of either USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 3-2**  
**GROUNDWATER ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

				Station: Field Sample ID: Date: Units: Depth:	AW-P1-GW-001-01 AW-P1-GW-001-01-AA-1 3/2/2011 ug/l 4.5 - 9.5	AW-P1-GW-001-01 AW-P1-GW-001-01-AA-1-F 3/2/2011 ug/l 4.5 - 9.5	AW-P1-GW-002-01 AW-P1-GW-002-01-AA-1 3/7/2011 ug/l 7 - 12	AW-P1-GW-002-01 AW-P1-GW-002-01-AA-1 3/9/2011 ug/l 7 - 12	AW-P1-GW-003-01 AW-P1-GW-003-01-AA-1 3/3/2011 ug/l 12 - 17	AW-P1-GW-004-01 AW-P1-GW-004-01-AA-1 3/3/2011 ug/l 9.5 - 14.5	AW-P1-GW-005-01 AW-P1-GW-005-01-AA-1 3/3/2011 ug/l 9.5 - 14.5
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>	Total	Dissolved	Total	Total	Total	Total	Total	Total
<b>Volatile Organic Compounds (VOC)</b>											
CHLOROFORM	0.19	1	2.5	1 U	-	-	1 U	<b>1.3</b>	<b>0.53</b> J	<b>0.75</b> J	
<b>Semivolatile Organic Compounds (SVOC)</b>											
BIS(2-ETHYLHEXYL) PHTHALATE	0.071	3	1.1	2 U	2 U	2.3 U	-	2 U	2.2 U	<b>1.1</b> J	
<b>Metals</b>											
ALUMINUM	50-200 <sup>(4)</sup>	30	865	<b>227</b>	<b>180</b> J	<b>505</b>	-	<b>1070</b>	<b>7230</b>	<b>30500</b>	
ARSENIC	0.045	3	0.56	<b>0.27</b> J	<b>0.11</b> J	<b>0.77</b> J	-	<b>1.1</b>	<b>10.4</b>	<b>54.5</b>	
CHROMIUM	0.031	1	16.8	10 U	10 U	<b>1.7</b> J	-	<b>1.8</b> J	<b>25</b>	<b>82</b>	
COBALT	4.7	0.5	1.6	50 U	50 U	0.3 J	-	<b>0.8</b> J	<b>2.6</b> J	<b>2</b> J	
COPPER	620	4	4.9	10 U	10 U	1	-	1.2	<b>16.8</b>	<b>61</b>	
IRON	11000	20	2850	211	174	<b>3470</b>	-	<b>1630</b>	<b>19000</b>	<b>75700</b>	
LEAD	15	5	ND	3 U	3 U	3 U	-	3 U	<b>9.6</b>	<b>30.5</b>	
MANGANESE	320	0.4	58.6	<b>16.5</b>	<b>15.6</b>	<b>66.4</b>	-	<b>24.1</b>	<b>94.8</b>	<b>78</b>	
MERCURY	0.63	0.05	0.11	0.2 U	0.2 U	0.2 U	-	0.2 U	0.4 U	0.8 U	
MERCURY (Low Level)	0.63	0.05	0.00795	0.00064	0.00002	-	0.0029	0.00262	<b>0.174</b>	0.0171 U	
NICKEL	300	4	6.5	1.1 J	-	<b>9.7</b> J	-	2.6 J	<b>12.8</b> J	<b>16</b> J	
SODIUM	NLE	400	3250	<b>1210</b> J	<b>1180</b> J	<b>2560</b>	-	<b>4220</b>	<b>3550</b> J	<b>5810</b> J	
ZINC	4700	10	51.1	8.8 J	8.7 J	3.5	-	4.4	<b>26.6</b> J	<b>71.5</b> J	
<b>Inorganics</b>											
CYANIDE	200	6	11	10 UJ	10 UJ	-	10 U	10 U	10 U	10 U	

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

ID - Identifier

- Not Analyzed.

ug/L - micrograms per liter

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

B - detected in the laboratory method blank

1 - U.S. Environmental Protection Agency - Regional Screening Levels (May, 2012) for tapwater. **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - practical quantitation limits. **Exceedances are underlined.**

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

4 - Secondary maximum contaminant level

5 - Health-based criteria



**TABLE 3-2**  
**GROUNDWATER ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

				Station: Field Sample ID: Date: Units: Depth:	AW-P1-GW-006-01 AW-P1-GW-006-01-AA-1 3/7/2011 ug/l 9.5 - 14.5	AW-P1-GW-006-01 AW-P1-GW-006-01-AA-1 3/9/2011 ug/l 9.5 - 14.5	AW-P1-GW-007-01 Background AW-P1-GW-007-01-AA-1 3/4/2011 ug/l 9 - 14	AW-P1-GW-007-01 Background AW-P1-GW-007-01-AA-1-F 3/4/2011 ug/l 9 - 14	AW-P1-GW-007-01 Background AW-P1-GW-007-01-AA-2 3/4/2011 ug/l 9 - 14	AW-P1-GW-008-01 Background AW-P1-GW-008-01-AA-1 3/4/2011 ug/l 6 - 11	AW-P1-GW-008-01 Background AW-P1-GW-008-01-AA-1-F 3/4/2011 ug/l 6 - 11
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>	Total	Total	Total	Dissolved	Total Duplicate	Total	Dissolved	
Volatile Organic Compounds (VOC)											
CHLOROFORM	0.19	1	2.5	-	3.3	2.4	-	2.5	1 U	-	
Semivolatile Organic Compounds (SVOC)											
BIS(2-ETHYLHEXYL) PHTHALATE	0.071	3	1.1	2 U	-	2.1 U	1.1 JB	2.1 U	2.1 U	2.1 U	
Metals											
ALUMINUM	50-200 <sup>(4)</sup>	30	865	769	-	480	441	454	865	727	
ARSENIC	0.045	3	0.56	0.27 J	-	0.42 J	0.41 J	0.46	0.56	0.4	
CHROMIUM	0.031	1	16.8	10 U	-	10 U	16.8	10 U	1.3	1.1 J	
COBALT	4.7	0.5	1.6	0.9 J	-	0.6 J	0.5 J	0.5 J	1.6 J	0.9 J	
COPPER	620	4	4.9	10 U	-	10 U	4.9	10 U	10 U	10 U	
IRON	11000	20	2850	2960	-	729	1150	597	2850	1470	
LEAD	15	5	ND	3 U	-	3 U	3 U	3 U	3 U	3 U	
MANGANESE	320	0.4	58.6	78.8	-	20.9	19.5	19.2	58.6	34.5	
MERCURY	0.63	0.05	0.11	0.2 U	-	0.2 U	0.2 U	0.2 U	0.11	0.2 U	
MERCURY (Low Level)	0.63	0.05	0.00795	-	0.00121	0.0072 U	0.00795	0.00778	0.00041	0.00024	
NICKEL	300	4	6.5	7.8 J	-	1.9 J	2.2 J	1.8 J	6.5 J	3.7 J	
SODIUM	NLE	400	3250	3020	-	3190	3250	3140	3190	3210	
ZINC	4700	10	51.1	2	-	35.5	51.1	36.5	3.7	5.1	
Inorganics											
CYANIDE	200	6	11	-	10 U	10 U	10 U	10 U	10 U	11	

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

ID - Identifier

- Not Analyzed.

ug/L - micrograms per liter

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

B - detected in the laboratory method blank

1 - U.S. Environmental Protection Agency - Regional Screening Levels (May, 2012) for tapwater. **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - practical quantitation limits. Exceedances are underlined.

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

4 - Secondary maximum contaminant level

5 - Health-based criteria

**TABLE 3-3**  
**SURFACE WATER ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**Egg Harbor Township, New Jersey**

Station: Field Sample ID: Date: Units:				AW-P1-SW-001-01 AW-P1-SW-001-01-01-1 3/3/2011 ug/l	AW-P1-SW-001-01 AW-P1-SW-001-01-01-1-F 3/3/2011 ug/l	AW-P1-SW-002-01 AW-P1-SW-002-01-01-1 3/1/2011 ug/l	AW-P1-SW-002-01 AW-P1-SW-002-01-01-1-F 3/1/2011 ug/l	AW-P1-SW-003-01 AW-P1-SW-003-01-01-1 3/3/2011 ug/l
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>	Total	Dissolved	Total	Dissolved	Total
<i>Semivolatile Organic Compounds (SVOC)</i>								
BIS(2-ETHYLHEXYL) PHTHALATE	1.2	0.3	1.6	2 U	2 U	<b>5.5</b> B	<b>4.8</b> B	2 U
<i>Metals</i>								
ARSENIC	0.018	0.017	0.28	<b>0.11</b> J	<b>0.17</b> J	<b>0.53</b> J	<b>0.34</b> J	<b>0.21</b> J
MERCURY	0.3	0.05	0.0113	0.2 U	0.2 U	<b>0.46</b>	<b>0.094</b> J	0.2 U
MERCURY (Low Level)	0.3	0.05	0.00719	0.0319	0.0111	<b>1.03</b>	<b>0.0924</b>	0.00348

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

ID - Identifier

ug/L - micrograms per liter

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

B - detected in the laboratory method blank

1 - U.S. Environmental Protection Agency - National Recommended Water Quality Criteria (lowest of human health, CMC, and CCC values). **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - Surface Water Quality Criteria for Toxic Substances (lowest of protection of Human Health, chronic, or acute). Exceedances are underlined.

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 3-3**  
**SURFACE WATER ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**Egg Harbor Township, New Jersey**

Station: AW-P1-SW-003-01 Field Sample ID: AW-P1-SW-003-01-01-1-F Date: 3/3/2011 Units: ug/l				AW-P1-SW-004-01	AW-P1-SW-004-01	AW-P1-SW-004-01	AW-P1-SW-004-01
				AW-P1-SW-004-01-01-1-F	AW-P1-SW-004-01-01-1	AW-P1-SW-004-01-01-2	AW-P1-SW-004-01-01-F
				3/4/2011	3/4/2011	3/4/2011	3/4/2011
				ug/l	ug/l	ug/l	ug/l
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>	Dissolved	Total	Total	Dissolved
Semivolatile Organic Compounds (SVOC)							
BIS(2-ETHYLHEXYL) PHTHALATE	1.2	0.3	1.6	3.8	2 U	2.1 U	2 U
Metals							
ARSENIC	0.018	0.017	0.28	0.25 J	0.16 J	0.15	0.14 J
MERCURY	0.3	0.05	0.0113	0.2 U	0.2 U	0.2 U	0.2 U
MERCURY (Low Level)	0.3	0.05	0.00719	0.00153	0.00162	0.00157	0.00109

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

ID - Identifier

ug/L - micrograms per liter

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

B - detected in the laboratory method blank

1 - U.S. Environmental Protection Agency - National Recommended Water Quality Criteria (lowest of human health, CMC, and CCC values). **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - Surface Water Quality Criteria for Toxic Substances (lowest of protection of Human Health, chronic, or acute). Exceedances are underlined.

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 3-3**  
**SURFACE WATER ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**Egg Harbor Township, New Jersey**

Station: Field Sample ID: Date: Units:				AW-P1-SW-005-01 Background AW-P1-SW-005-01-01-1 3/4/2011 ug/l	AW-P1-SW-005-01 Background AW-P1-SW-005-01-01-1-F 3/4/2011 ug/l	AW-P1-SW-006-01 Background AW-P1-SW-006-01-01-1 3/2/2011 ug/l	AW-P1-SW-006-01 Background AW-P1-SW-006-01-01-1-F 3/2/2011 ug/l
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>	Total	Dissolved	Total	Dissolved
<i>Semivolatile Organic Compounds (SVOC)</i>							
BIS(2-ETHYLHEXYL) PHTHALATE	1.2	0.3	1.6	<b><u>1.3</u></b> JB	<b><u>1.6</u></b> JB	2 U	2 U
<i>Metals</i>							
ARSENIC	0.018	0.017	0.28	<b><u>0.21</u></b> J	<b><u>0.17</u></b> J	<b><u>0.28</u></b> J	<b><u>0.3</u></b> J
MERCURY	0.3	0.05	0.0113	0.2 U	0.2 U	0.2 U	0.2 U
MERCURY (Low Level)	0.3	0.05	0.00719	0.00235	-	0.0113	0.00719

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

ID - Identifier

ug/L - micrograms per liter

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated

B - detected in the laboratory method blank

1 - U.S. Environmental Protection Agency - National Recommended Water Quality Criteria (lowest of human health, CMC, and CCC values). **Exceedances are bolded.**

2 - New Jersey Department of Environmental Protection Agency - Surface Water Quality Criteria for Toxic Substances (lowest of protection of Human Health, chronic, or acute). Exceedances are underlined.

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 3-4**  
**SEDIMENT ANALYTICAL RESULTS - EXCEEDANCES**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

Station: Field Sample ID: Date: Units: Depth:				AW-P1-SD-001-01 AW-P1-SD-001-01-01-1 3/3/2011 mg/kg 0 - 0.5	AW-P1-SD-002-01 AW-P1-SD-002-01-01-1 3/1/2011 mg/kg 0 - 0.5	AW-P1-SD-003-01 AW-P1-SD-003-01-01-1 3/3/2011 mg/kg 0 - 0.5	AW-P1-SD-004-01 AW-P1-SD-004-01-01-1 3/4/2011 mg/kg 0 - 0.5	AW-P1-SD-004-01 AW-P1-SD-004-01-01-2 3/4/2011 mg/kg 0 - 0.5	AW-P1-SD-005-01 Background 3/4/2011 mg/kg 0 - 0.5	AW-P1-SD-006-01 Background 3/2/2011 mg/kg 0 - 0.5
Analyte	USEPA Criteria <sup>1</sup>	NJDEP Criteria <sup>2</sup>	Background <sup>3</sup>					Duplicate		
<b>Semivolatile Organic Compounds (SVOC)</b>										
2-METHYLNAPHTHALENE	310	0.02	ND	0.24 U	0.2 U	0.18 U	0.11 U	<u>0.0381</u> J	0.18 U	0.17 UJ
BIS(2-ETHYLHEXYL) PHTHALATE	35	0.182	0.272	<u>0.365</u> B	<u>0.216</u> B	0.144	0.165	0.163	<u>0.272</u> B	<u>0.259</u> B
DIETHYL PHTHALATE	49000	0.295	0.193	<u>0.408</u> B	<u>0.345</u> B	0.227	0.155	0.0802	0.139	0.193 J
DI-N-BUTYL PHTHALATE	6100	0.11	3.49	<u>4.62</u> B	<u>4.62</u> B	<u>2.09</u> B	<u>2.27</u> B	<u>1.23</u> B	<u>2.36</u> B	<u>3.49</u> B
PHENOL	18000	0.048	ND	0.24 U	0.2 U	0.18 U	<u>0.0778</u> J	<u>0.052</u> J	0.18 U	0.17 UJ
<b>SVOC Selected Ion Monitoring (SIM)</b>										
ACENAPHTHENE	3400	0.0067	ND	0.011 U	0.01 U	0.0089 U	<u>0.00854</u>	<u>0.00944</u>	0.0091 U	0.0083 UJ
ACENAPHTHYLENE	NLE	0.00587	ND	0.011 U	0.01 U	<u>0.0186</u>	<u>0.0444</u>	<u>0.041</u>	0.0091 U	0.0083 UJ
BENZO(A)ANTHRACENE	0.15	0.108	0.0162	0.0405	0.01 U	0.0441	<u>0.136</u>	<u>0.118</u>	0.0162	0.0083 UJ
BENZO(A)PYRENE	0.015	0.15	0.0114	<b>0.0209</b>	0.01 U	<b>0.0299</b>	<b>0.0856</b>	<b>0.104</b>	0.0114	0.0083 UJ
DIBEN(A,H)ANTHRACENE	0.015	0.033	ND	<b>0.0155</b>	0.01 U	0.0089 U	<b>0.024</b>	<b>0.0291</b>	0.0091 U	0.0083 UJ
PYRENE	1700	0.195	0.0189	0.0504	0.0174	0.0881	<u>0.257</u>	<u>0.225</u>	0.0189	0.0083 UJ
<b>Pesticides</b>										
4,4-DDD	2	0.0049	ND	0.00041	<u>0.0186</u>	0.00093	<u>0.0059</u>	<u>0.0052</u>	0.00029 U	0.00029 UJ
4,4-DDE	1.4	0.0032	ND	0.00042	<u>0.0117</u>	0.00075	0.00019 U	0.00037	0.00029 U	0.00029 UJ
4,4-DDT	1.7	0.0042	ND	0.00082	<u>0.0086</u>	0.00031 U	0.00019 U	0.00019 U	0.00029 U	0.00029 UJ
<b>Metals</b>										
ARSENIC	0.39	6	0.36	<b>1.6</b>	<b>1.2</b>	0.36 J	<b>0.65</b>	<b>0.7</b>	0.27 J	0.36 J
CHROMIUM	0.29	26	3.2	<b>7.1</b>	<b>10.8</b>	<b>1.3</b> J	<b>2.4</b>	<b>2.3</b>	<b>1.6</b> J	<b>3.2</b>
COPPER	3100	16	2.9	<u>18.4</u>	<u>12.3</u>	2.1	1.7	1.7	2.9	2.6 J
MERCURY	10	0.174	0.0467	0.092	<u>13.2</u>	0.078 U	0.047 U	0.052 U	0.078 U	0.083 UJ
MERCURY (Low Level)	10	0.174	0.0467	0.0817	<u>13.7</u>	0.0429	0.0185	0.0186	0.0467	0.0423
THALLIUM	0.78	NLE	ND	<b>0.88</b> J	2.5 U	0.62 J	0.57 J	0.45 J	2.4 U	2.6 UJ
<b>Inorganics</b>										
CYANIDE, TOTAL	0.1	0.0001	0.59	0.77 U	<u>0.1</u> J	0.63 U	0.36 U	0.34 U	0.59 U	<b>0.11</b> J

**NOTES:**

Only compounds that were detected in at least one sample and exceed the lowest of the EPA or NJDEP criteria are presented here. All analytical data can be found in Appendix G.

ID - Identifier

mg/kg - milligrams per kilogram

NJDEP - New Jersey Department of Environmental Protection

NLE - No Level Established

U - not detected (at method detection limit)

J - estimated (high moisture content)

<sup>1</sup>U.S. Environmental Protection Agency - strictest of industrial and residential soil screening criteria. Regional Screening Levels (May, 2012). **Exceedances are bolded.**

<sup>2</sup> - New Jersey Department of Environmental Protection Agency - lowest effect level (LEL) sediment screening criteria. Exceedances are underlined.

<sup>3</sup> - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 4-1**  
**ENGLISH CREEK AVENUE EPA RESIDENTIAL WELL SAMPLING RESULTS (USEPA 2006)**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

		Location		A	B	C	D	E	F	G	H	I	J	K	Max	Mean
		Depth (ft.):		123	85	NR	NR	NR	90	85	NR	NR	88	NR		
Analyte Name	RSL for Tapwater	USEPA MCL	Units													
Organics																
CHLOROFORM	0.19	80	ug/L	7.7	8.2	2.7	8.9	2.9	7.8	8.8	4.3	1.9	3.1	6	8.9	5.7
DICHLORODIFLUOROMETHANE	190	NLE	ug/L	-	-	-	-	-	-	-	0.59	-	1.4	-	1.4	1.00
METHANE, DICHLOROFLUORO	NLE	NLE	ug/L	-	-	-	-	0.84	-	-	0.5	-	0.81	-	0.84	0.72
METHANE, CHLOROFLUORO	NLE	NLE	ug/L	-	-	-	-	0.76	-	-	0.81	0.58	1.6	-	1.60	0.94
Inorganics																
ALUMINUM	16000	50 - 200 <sup>(1)</sup>	ug/L	-	-	640	-	110	120	-	2,500	-	4,100	860	4,100	1,388
BARIUM	2,900	2,000	ug/L	20	19	33	16	26	55	29	27	40	19	52	55	31
BERYLLIUM	16	4	ug/L	-	-	-	-	-	-	-	1.2	-	1.5	-	1.5	1.4
CALCIUM	NLE	NLE	ug/L	-	-	4,600	-	9,300	890	-	12,000	33,000	16,000	4,200	33,000	11,427
COBALT	4.7	NLE	ug/L	-	-	24	-	10	4.2	-	52	-	78	4.7	78.0	28.8
COPPER	620	1,300	ug/L	69	51	71	390	5.7	82	190	13	3.2	7.9	18	390	81.9
IRON	11000	300 <sup>(1)</sup>	ug/L	420	-	-	-	-	-	-	-	-	-	-	420	420
LEAD	NLE	15	ug/L	55	4.1	4.1	15	2	4.3	16	5.6	-	2.1	1	55.0	10.9
MANGANESE	320	50 <sup>(1)</sup>	ug/L	6.7	1.8	360	2.1	550	92	4.5	1,300	1,200	1,900	190	1,900	509.7
MAGNESIUM	NLE	NLE	ug/L	550	510	8,300		16,000	2,200	830	22,000	45,000	32,000	9,300	45,000	13,669
MERCURY	0.63	2	ug/L	-	-	0.21	-	-	-	-	0.58	-	-	0.24	0.58	0.34
NICKEL	300	NLE	ug/L	-	-	3	1.5	1.2	2.3	-	5.5	-	12	1.6	12	3.9
POTASSIUM	NLE	NLE	ug/L	-	-	1,100	-	910	710	530	2,000	3,600	2,200	930	3,600	1,498
SODIUM	NLE	20,000 <sup>(2)</sup>	ug/L	3,400	3,400	7,600	2,900	9,500	3,900	3,500	13,000	12,000	19,000	9,000	19,000	7,927
VANADIUM	NLE	NLE	ug/L	17	16	16	18	19	14	17	13	14	11	16	19	16
ZINC	4700	5,000 <sup>(1)</sup>	ug/L	25	44	28	82	14	53	40	54	7	36	11	82	36

RSL for Tapwater - **Exceedances are bolded.**

USEPA MCL - U.S. Environmental Protection Agency Maximum Contaminant Level



- Exceedance - Exceedance of MCL



- Exceedance - Exceedance of Secondary MCL (non-enforceable)

(1) - Secondary Maximum Contaminant Level

(2) - Health-based value

NLE - No Level Established

" - " Not detected

NR - Not Reported

ft - feet

ug/L - micrograms per liter

Data provided to USACE by Keith Buch (FAA) via email on November 17, 2006

**TABLE 5-1**  
**ECOLOGICAL RISK SCREENING RESULTS - SOIL**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

			Station: Field Sample ID: Date: Depth:	AW-P1-SS-001-01 AW-P1-SS-001-01- 01-1 3/1/2011 0 - 0.5	AW-P1-SS-001-01 AW-P1-SS-001-01- 01-2 3/1/2011 0 - 0.5	AW-P1-SS-001-01 AW-P1-SS-001-01- 02-1 3/1/2011 4 - 4.5	AW-P1-SS-002-01 AW-P1-SS-002-01- 01-1 3/1/2011 0 - 0.5	AW-P1-SS-002-01 AW-P1-SS-002-01- 02-1 3/1/2011 6 - 6.5	AW-P1-SS-003-01 AW-P1-SS-003-01- 01-1 3/1/2011 0 - 0.5
Analyte	Lowest Ecological Screening - Soil <sup>1</sup>	Maximum Background Concentration <sup>2</sup>	Units		Duplicate				
<i>Semivolatile Organic Compounds (SVOC)</i>									
DI-N-BUTYL PHTHALATE	0.15	1.79	mg/kg	<b>0.725</b> B	<b>1.51</b> B	<b>1.65</b> B	<b>1.94</b> B	<b>0.645</b> B	<b>0.692</b> B
<i>Metals</i>									
ALUMINUM	50	7670	mg/kg	<b>11800</b>	<b>8570</b>	<b>1190</b>	<b>6140</b>	<b>6950</b>	<b>8670</b>
CHROMIUM	0.4	9.1	mg/kg	<b>13.9</b>	<b>9</b>	<b>1.5</b>	<b>6.5</b>	<b>8.7</b>	<b>9.7</b>
COBALT	0.14	0.37	mg/kg	<b>1.1</b> J	<b>0.53</b> J	0.082 J	<b>0.27</b> J	<b>0.27</b> J	<b>0.46</b> J
LEAD	0.0537	5.3	mg/kg	<b>22</b>	<b>11.5</b>	<b>1.3</b> J	<b>11.9</b>	<b>3.9</b>	<b>14.7</b>
VANADIUM	2	14.3	mg/kg	<b>16.7</b>	<b>12.1</b>	1.2	<b>8.1</b>	<b>6.5</b>	<b>12.8</b>
ZINC	6.62	4.1	mg/kg	<b>9.4</b>	<b>7.2</b>	3.2	5.8	3.1	6.4

**Notes:**

1 - Lowest Ecological Screening - Soil = strictest of the EPA ecological soil SSLs and NJDEP ecological soil screening criteria. **Exceedances are bolded.**

2 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 5-1**  
**ECOLOGICAL RISK SCREENING RESULTS - SOIL**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

			Station: Field Sample ID: Date: Depth:	AW-P1-SS-003-01 AW-P1-SS-003-01- 02-1 3/1/2011 10.5 - 11	AW-P1-SS-004-01 AW-P1-SS-004-01- 01-1 3/1/2011 0 - 0.5	AW-P1-SS-004-01 AW-P1-SS-004-01- 02-1 3/1/2011 11.5 - 12	AW-P1-SS-005-01 AW-P1-SS-005-01- 01-1 3/1/2011 0 - 0.5	AW-P1-SS-005-01 AW-P1-SS-005-01- 02-1 3/1/2011 12 - 12.5	AW-P1-SS-006-01 AW-P1-SS-006-01- 01-1 3/1/2011 0 - 0.5						
Analyte	Lowest Ecological Screening - Soil <sup>1</sup>	Maximum Background Concentration <sup>2</sup>	Units												
Semivolatile Organic Compounds (SVOC)															
DI-N-BUTYL PHTHALATE	0.15	1.79	mg/kg	0.957	B	1.73	B	0.703	B	1.77	B	0.612	B	0.918	
Metals															
ALUMINUM	50	7670	mg/kg	3360		5920		3540		5860		7790		7800	
CHROMIUM	0.4	9.1	mg/kg	6.5		7.7		10.1		6.9		7.8		9.8	
COBALT	0.14	0.37	mg/kg	0.17	J	0.45	J	0.23	J	0.37	J	0.25	J	0.49	J
LEAD	0.0537	5.3	mg/kg	2.3		25.7		5.9		14.2		3.1		16.2	
VANADIUM	2	14.3	mg/kg	3.4		10.1		10.5		10.3		8.1		12	
ZINC	6.62	4.1	mg/kg	2.6		9.3		6.3		5.4		2.4		10.2	

**Notes:**

1 - Lowest Ecological Screening - Soil = strictest of the EPA ecological soil SSLs and NJDEP ecological soil screening criteria. **Exceedances are bolded.**

2 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.



**TABLE 5-1**  
**ECOLOGICAL RISK SCREENING RESULTS - SOIL**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

			Station: Field Sample ID: Date: Depth:	AW-P1-SS-006-01 AW-P1-SS-006-01- 02-1 3/1/2011 12 - 12.5	AW-P1-SS-007-01 AW-P1-SS-007-01- 01-1 3/2/2011 0 - 0.5	AW-P1-SS-007-01 AW-P1-SS-007-01- 02-1 3/2/2011 6.5 - 7	AW-P1-SS-008-01 AW-P1-SS-008-01- 01-1 3/2/2011 0 - 0.5	AW-P1-SS-008-01 AW-P1-SS-008-01- 02-1 3/2/2011 7.5 - 8					
Analyte	Lowest Ecological Screening - Soil <sup>1</sup>	Maximum Background Concentration <sup>2</sup>	Units										
Semivolatile Organic Compounds (SVOC)													
DI-N-BUTYL PHTHALATE	0.15	1.79	mg/kg	1.14	B	1.7	B	0.811	B	0.911	B	1.79	B
Metals													
ALUMINUM	50	7670	mg/kg	14300		5030		1530		3820	J	7670	
CHROMIUM	0.4	9.1	mg/kg	14.8		5.6		2.4		4.7		9.1	
COBALT	0.14	0.37	mg/kg	0.66	J	0.34	J	0.11	J	0.29	J	0.37	J
LEAD	0.0537	5.3	mg/kg	4.4		3		2.1		5.3		4.6	
VANADIUM	2	14.3	mg/kg	16.7		6		2.2	J	6.1		14.3	
ZINC	6.62	4.1	mg/kg	6.5		3.1		1.2	J	4		4.1	

**Notes:**

1 - Lowest Ecological Screening - Soil = strictest of the EPA ecological soil SSLs and NJDEP ecological soil screening criteria. **Exceedances are bolded.**

2 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

**TABLE 5-2**  
**REGIONAL SOIL CONSTITUENT CONCENTRATIONS**  
**Area W - Site Investigation Report**  
**ACNAS FUDS, Egg Harbor Township, New Jersey**

<i>Analyte</i>	Lowest Ecological Screening - Soil <sup>1</sup>	Maximum Background Concentration <sup>2</sup>	Mean Ambient Levels in NJ Rural Coastal Plain <sup>3</sup>	Maximum Ambient Levels in NJ Rural Coastal Plain <sup>3</sup>	Mean Ambient Levels in NJ Urban Coastal Plain <sup>4</sup>	Maximum Ambient Levels in NJ Urban Coastal Plain <sup>4</sup>	Area W Minimum	Area W Mean	Area W Maximum
<b>ALUMINUM</b>	50	7,670	2,795	<b>17,400</b>	6,734	<b>23,100</b>	1,190	7,068	14,300
<b>CHROMIUM</b>	0.4	9.1	4.7	<b>21.2</b>	<b>18.7</b>	<b>171</b>	1.5	9	14.8
<b>IRON</b>	200	2,570	4,258	<b>37,800</b>	<b>11,909</b>	<b>68,900</b>	429	4,495	12,600
<b>VANADIUM</b>	2	14.3	9.11	<b>29.6</b>	<b>21.1</b>	<b>202</b>	1.2	10	16.7
<b>CYANIDE, TOTAL</b>	0.005	0.098	NA	NA	NA	NA	0.05	0	0.135

**Notes:**

All values are presented in mg/kg

1 - Lowest Ecological Screening - Soil = strictest of the following soil screening criteria.

- Efroymson et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision.

- Efroymson et al. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision.

- Efroymson et al. 1997. Preliminary Remediation Goals for Ecological Endpoints.

- USEPA Region 3. 1995. Revised Region 3 BTAG screening levels. Memorandum from R.S. Davis to Users. 9 August.

- USEPA Region 5, RCRA - Ecological Screening Tables, <http://www.epa.gov/Region5/rcraca/edql.htm>.

2 - Maximum background concentration.

3 - Characterization of Ambient Levels of Selected Metals and CPAHs in New Jersey Soils: Year III – Rural Areas of New Jersey, Highlands, Valley and Ridge, and Coastal Plan Physiographic Provinces (Table 14 - BEM Systems, 2002)

4 - Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Urban Coastal Plain Region Soils (Table 8 - BEM Systems, 1998)

**Bold values are greater than measures mean or maximum Area W concentrations.**

TABLE 5-3  
ECOLOGICAL RISK SCREENING - SURFACE WATER  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

				Location ID:	AW-P1-SW-001-01	AW-P1-SW-001-01	AW-P1-SW-002-01	AW-P1-SW-002-01	AW-P1-SW-003-01	AW-P1-SW-003-01	AW-P1-SW-004-01
				Field Sample ID:	AW-P1-SW-001-01-01-1	AW-P1-SW-001-01-01-1-F	AW-P1-SW-002-01-01-1	AW-P1-SW-002-01-01-1-F	AW-P1-SW-003-01-01-1-F	AW-P1-SW-003-01-01-1	AW-P1-SW-004-01-01-2
				Sample Date:	3/3/2011	3/3/2011	3/1/2011	3/1/2011	3/3/2011	3/3/2011	3/4/2011
				Units:	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
				Depth:	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
Analyte	EPA Strictest Ecological <sup>1</sup>	NJDEP Strictest Ecological <sup>2</sup>	Maximum Detected Background <sup>3</sup>								
Volatile Organic Compounds (VOC)											
CHLOROFORM	1.8	140	ND	0.72 J	0.47 J	3.7	4.7	1 U	1 U	1 U	
TOLUENE (VOA)	2	253	7.8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
Semivolatile Organic Compounds (SVOC)											
BIS(2-ETHYLHEXYL) PHTHALATE	16	0.3	1.6	2 U	2 U	5.5 B	4.8 B	3.8	2 U	2.1 U	
Metals											
ALUMINUM	87	NLE	472	290	NA	178 J	NA	NA	324	176 J	
ALUMINUM (DISSOLVED)	87	NLE	377	NA	228	NA	149 J	313	NA	NA	
BARIUM	4	220	39.4	31 J	NA	66.4 J	NA	NA	67.2 J	33.9 J	
BARIUM (DISSOLVED)	4	220	39.3	NA	30.8 J	NA	65.1 J	67.6 J	NA	NA	
IRON	300	NLE	904	95.2 J	NA	561	NA	NA	46.5 J	218	
IRON (DISSOLVED)	300	NLE	776	NA	45.2 J	NA	416	45.6 J	NA	NA	
MERCURY	0.026	0.77	0.0113	0.0319	NA	1.03	NA	NA	0.00348	0.00157	
MERCURY (DISSOLVED)	0.026	0.77	0.00719	NA	0.0111	NA	0.0924	0.00153	NA	NA	
MERCURY	0.026	0.77	0.0113	0.2 U	NA	0.46	NA	NA	0.2 U	0.2 U	
MERCURY (DISSOLVED)	0.026	0.77	0.00719	NA	0.2 U	NA	0.094 J	0.2 U	NA	NA	
METHYL MERCURY	0.004	NLE	0.00128	0.00138	NA	0.00933 B	NA	NA	0.00019	0.000096	
METHYL MERCURY (DISSOLVED)	0.004	NLE	0.000739	NA	0.00123	NA	0.00456 B	0.000137	NA	NA	
SELENIUM	1	5	1.6	10 U	NA	10 U	NA	NA	10 U	10 U	
SELENIUM (DISSOLVED)	1	5	2	NA	10 U	NA	10 U	10 U	NA	NA	

**Notes:**

1 - Strictest USEPA Ecological Screening - Surface Water Freshwater.

**Exceedances are bolded.**

- USEPA. April 2009. National Recommended Water Quality Criteria.

- Suter, G.W. & C.L. Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. - Secondary Chronic Values only

- USEPA Region 3. 2005. Revised Region 3 BTAG screening levels.

2 - NJDEP. Strictest of 2009 Freshwater Aquatic chronic and acute screening criteria. Exceedances are underlined

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

TABLE 5-3  
ECOLOGICAL RISK SCREENING - SURFACE WATER  
Area W - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

				Location ID:	AW-P1-SW-004-01	AW-P1-SW-004-01	AW-P1-SW-004-01	AW-P1-SW-005-01	AW-P1-SW-005-01	AW-P1-SW-006-01	AW-P1-SW-006-01
				Field Sample ID:	AW-P1-SW-004-01-01-1-F	AW-P1-SW-004-01-01-1	AW-P1-SW-004-01-01-F	AW-P1-SW-005-01-01-1	AW-P1-SW-005-01-01-1-F	AW-P1-SW-006-01-01-1-F	AW-P1-SW-006-01-01-1
				Sample Date:	3/4/2011	3/4/2011	3/4/2011	3/4/2011	3/4/2011	3/2/2011	3/2/2011
				Units:	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
				Depth:	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
Analyte	EPA Strictest Ecological <sup>1</sup>	NJDEP Strictest Ecological <sup>2</sup>	Maximum Detected Background <sup>3</sup>								
Volatile Organic Compounds (VOC)											
CHLOROFORM	1.8	140	ND	NA	0.37 J	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE (VOA)	2	253	7.8	NA	1 U	1 U	1 U	1 U	7.7	7.8	
Semivolatile Organic Compounds (SVOC)											
BIS(2-ETHYLHEXYL) PHTHALATE	16	0.3	1.6	NA	2 U	2 U	1.3 JB	1.6 JB	2 U	2 U	
Metals											
ALUMINUM	87	NLE	472	NA	175 J	NA	209	NA	NA	472	
ALUMINUM (DISSOLVED)	87	NLE	377	NA	NA	178 J	NA	202	377	NA	
BARIUM	4	220	39.4	NA	33.7 J	NA	27.1 J	NA	NA	39.4 J	
BARIUM (DISSOLVED)	4	220	39.3	NA	NA	34.2 J	NA	26.9 J	39.3 J	NA	
IRON	300	NLE	904	NA	215	NA	119	NA	NA	904	
IRON (DISSOLVED)	300	NLE	776	NA	NA	216	NA	118	776	NA	
MERCURY	0.026	0.77	0.0113	NA	0.00162	NA	0.00235	NA	NA	0.0113	
MERCURY (DISSOLVED)	0.026	0.77	0.00719	0.00109	NA	NA	NA	0.00163	0.00719	NA	
MERCURY	0.026	0.77	0.0113	NA	0.2 U	NA	0.2 U	NA	NA	0.2 U	
MERCURY (DISSOLVED)	0.026	0.77	0.00719	NA	NA	0.2 U	NA	0.2 U	0.2 U	NA	
METHYL MERCURY	0.004	NLE	0.00128	NA	0.000108	NA	0.000628	NA	NA	0.00128 B	
METHYL MERCURY (DISSOLVED)	0.004	NLE	0.000739	0.000087	NA	NA	NA	0.000564	0.000739	NA	
SELENIUM	1	5	1.6	NA	10 U	NA	10 U	NA	NA	1.6 J	
SELENIUM (DISSOLVED)	1	5	2	NA	NA	10 U	NA	2 J	10 U	NA	

**Notes:**

1 - Strictest USEPA Ecological Screening - Surface Water Freshwater.

**Exceedances are bolded.**

- USEPA. April 2009. National Recommended Water Quality Criteria.

- Suter, G.W. & C.L. Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. - Secondary Chronic Values only

- USEPA Region 3. 2005. Revised Region 3 BTAG screening levels.

2 - NJDEP. Strictest of 2009 Freshwater Aquatic chronic and acute screening criteria. Exceedances are underlined

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.

TABLE 5-4  
ECOLOGICAL RISK SCREENING - SEDIMENT  
Area w - Site Investigation Report  
ACNAS FUDS, Egg Harbor Township, New Jersey

				Location ID:	AW-P1-SD-001-01	AW-P1-SD-002-01	AW-P1-SD-003-01	AW-P1-SD-004-01	AW-P1-SD-004-01	AW-P1-SD-005-01	AW-P1-SD-006-01
				Field Sample ID:	AW-P1-SD-001-01-01-1	AW-P1-SD-002-01-01-1	AW-P1-SD-003-01-01-1	AW-P1-SD-004-01-01-2	AW-P1-SD-004-01-01-1	AW-P1-SD-005-01-01-1	AW-P1-SD-006-01-01-1
				Sample Date:	3/3/2011	3/1/2011	3/3/2011	3/4/2011	3/4/2011	3/4/2011	3/2/2011
				Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				Depth:	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
Analyte	USEPA Strictest Ecological <sup>1</sup>	NJDEP Strictest Ecological <sup>2</sup>	Maximum Detected Background <sup>3</sup>								
Semivolatile Organic Compounds (SVOC)											
2-METHYLNAPHTHALENE (BNA)	0.0202	0.0202	ND	0.24 U	0.2 U	0.18 U	0.0381 J	0.11 U	0.18 U	0.17 U	
BIS(2-ETHYLHEXYL) PHTHALATE	0.18	0.182	0.272	0.365 B	0.216 B	0.144 JB	0.163 B	0.165 B	0.272 B	0.259 B	
DIETHYL PHTHALATE	0.603	0.295	0.193	0.408 B	0.345 B	0.227 B	0.0802 JBJ	0.155 B	0.139 JBJ	0.193 B	
DI-N-BUTYL PHTHALATE	6.47	0.11	3.49	4.62 B	4.62 B	2.09 B	1.23 B	2.27 B	2.36 B	3.49 B	
PHENOL	0.42	0.048	ND	0.24 U	0.2 U	0.18 U	0.052 J	0.0778 J	0.18 U	0.17 U	
SVOC Selected Ion Monitoring											
ACENAPHTHENE (SIM)	0.0067	0.00671	ND	0.011 U	0.01 U	0.0089 U	0.00944	0.00854	0.0091 U	0.0083 U	
ACENAPHTHYLENE (SIM)	0.0059	0.00587	ND	0.011 U	0.01 U	0.0186	0.041	0.0444	0.0091 U	0.0083 U	
BENZO(A)ANTHRACENE (SIM)	0.108	0.108	0.0162	0.0405	0.01 U	0.0441	0.118	0.136	0.0162	0.0083 U	
BENZO(B)FLUORANTHENE (SIM)	0.0272	10.4	0.0112	0.0241	0.01 U	0.0407	0.0831	0.112	0.0112	0.0083 U	
INDENO(1,2,3-CD)PYRENE (SIM)	0.017	0.2	ND	0.0176	0.01 U	0.0186	0.0516	0.0605	0.0091 U	0.0083 U	
PYRENE (SIM)	0.195	0.195	0.0189	0.0504	0.0174	0.0881	0.225	0.257	0.0189	0.0083 U	
Pesticides											
4,4-DDD	0.00488	0.00488	ND	0.00041	0.0186	0.00093	0.0052	0.0059	0.00029 U	0.00029 U	
4,4-DDE	0.00316	0.00316	ND	0.00042	0.0117	0.00075	0.00037	0.00019 U	0.00029 U	0.00029 U	
4,4-DDT	0.00416	0.00416	ND	0.00082	0.0086	0.00031 U	0.00019 U	0.00019 U	0.00029 U	0.00029 U	
Metals											
COPPER	31.6	16	2.9	18.4	12.3	2.1 J	1.7 J	1.7 J	2.9 J	2.6 J	
MERCURY	0.18	0.174	0.0467	0.0817	13.7	0.0429	0.0186	0.0185	0.0467	0.0423	
MERCURY	0.18	0.174	0.0467	0.092 J	13.2	0.078 U	0.052 U	0.047 U	0.078 U	0.083 U	
SELENIUM	2	NLE	ND	3.4 J	1.7 J	5.4 U	3.2 U	3.1 U	4.7 U	5.2 U	
Inorganics											
CYANIDE, TOTAL	0.1	0.0001	0.11	0.77 U	0.1 J	0.63 U	0.34 U	0.36 U	0.59 U	0.11 J	

**Notes:**

1 - Strictest USEPA Ecological Screening -Sediment Freshwater.

**Exceedances are bolded.**

- Ontario Ministry of Environment and Energy (OMEE). 1993. Guidelines for the protection and management of sediment quality in Ontario. ISBN 0-7729-9248-7. 27 pp

- USEPA Region 3. 2006. Revised Region 3 BTAG screening levels. Memorandum from R.S. Davis to Users. 9 August. Flora and Fauna values unless noted.

- Jones, D.S., G.W. Suter, & R.N Hill. 1997 Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision. Oak Ridge National Laboratory. ES/ER/TM-95/R4, Oak Ridge National Laboratory, Oak Ridge, TN.

- Long et al. 1995. Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. (ER-L values).

2 - NJDEP - 2009. Freshwater Lowest Effect Levels Screening Criteria.

3 - Exceedances of USEPA or NJDEP criteria and maximum background concentration are shaded.